AMERICAN BEE JOURNAL

APRIL, 1921

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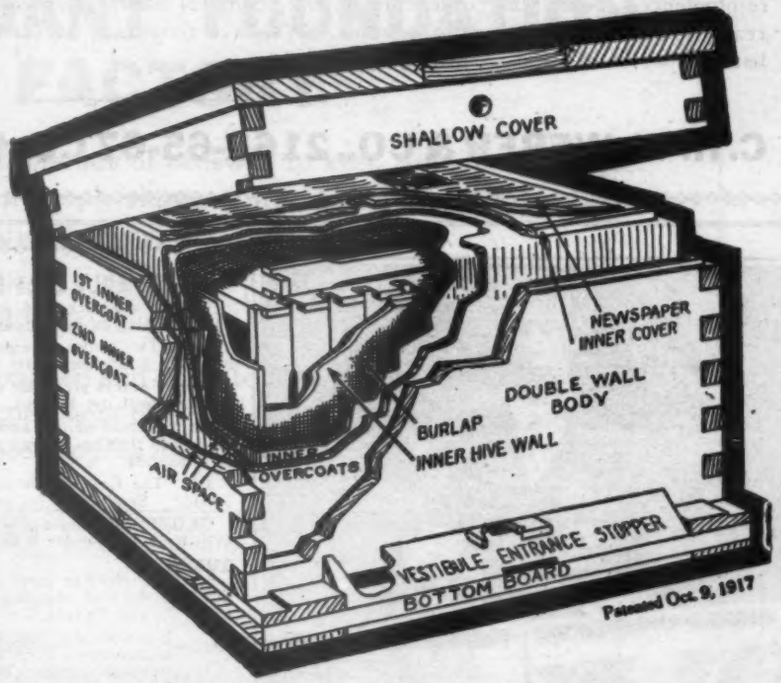

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AMERICAN BEE JOURNAL

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PACKAGE BEES

BY DAVID RUNNING

MY experience with package bees began in the spring of 1917, and has continued each year since. My records show as follows:

1917—Twenty 2-pound packages of bees delivered at my station April 27, cost $3.25 each, at shipping point. Express charges were 27c each and they were fed about 5 pounds (one comb) of honey each, which at 17c per pound would equal 85c, making a total cost of $4.37 per colony or package.

These 20 packages produced a total of 1,675 pounds of honey, or an average of 83¾ pounds per colony, which at 17c per pound would bring $284.74, of $14.23¾ per colony, making a net return of $9.86¾ per package.

Ten 2-pound packages delivered May 15, or 18 days later than the other 20 cost $3 per package at shipping point. The express charges were 37½c per package, and these were also fed about 5 pounds of honey each, which at 17c per pound equals 85c, making a total cost of $4.32½ per package or colony. These 10 colonies produced 585 pounds of honey, or an average of 58½ pounds per colony, which at 17c per pound would equal $99.45, or $9.94½ per colony, making a net return of $5.72 per colony.

You will notice from these figures that the packages received first gave me $4.14¾ per package more than those which were delivered 18 days later, or an average of 23c per day for each package for the 18 days. All 30 arrived in good condition.

1918—100 2-pound packages were ordered for delivery between April 25 and May 1. Owing to the congested conditions of transportation and to the fact that not enough food was allowed, this lot of bees arrived in very poor condition, many being entirely dead, so that only 39 were built up out of the lot. The shipper made good a portion of the loss, so that the 39 cost, delivered at my station, $356.50. Three hundred pounds of honey was fed at 25c per pound, equaling $75, making an average cost of $11.07. These 39 colonies gave an average of 140 pounds per colony and a total of 5,460 pounds of honey, which netted 25c per pound, making an average of $35, and a total of $1,365, or a net average of $23.83, and a total net of $933.50.

1919—Fifty 2-pound packages received April 21 by parcels post; 2 dead, 5 about 50 per cent dead, 3 queens dead, so far as detected. The 5 partly dead were made into two colonies. Fourteen packages April 25, in apparent good shape. Thirty-three packages April 26 in apparent good shape. Soft maple not yet in full bloom, an occasional blossom open in tops of trees. Three packages April 28, in apparent good shape. May 6 and 10 all cages removed from hives. Total queens dead or missing, 23; these were replaced by the shippers. The above 95 2-pound packages cost, delivered by parcels post, $555. Five hundred pounds of honey was fed at 25c, equaling $125, making a total cost of $680, or an average of $7.16 per colony or package.

The 95 colonies averaged 34¾ lbs. at 24c, making $8.34, and gave a total of 3,300 pounds at 24c—$792. Seventy colonies of increase was made from the above, worth $4 per colony—$280; making an average gross income of $11.29½ and a total of $1,072, or a net income of $4.13½ per package, and total of $392 for the lot. This was the poorest season for bees during my 19 years in the business, owing to cold weather and drought.

1920—May 7, fifteen 3-pound packages received, all in fine condition; May 8 11 packages received in fine

Filling packages with bees in a Southern apiary.

condition; May 10 14 packages received in fine condition; May 11 10 packages received in fine condition; all queens alive and very few dead bees in cages. May 18 all package colonies inspected and all queens laying but four. Two by accident not yet out of cages, one other seen and found laying following day, and one missing.

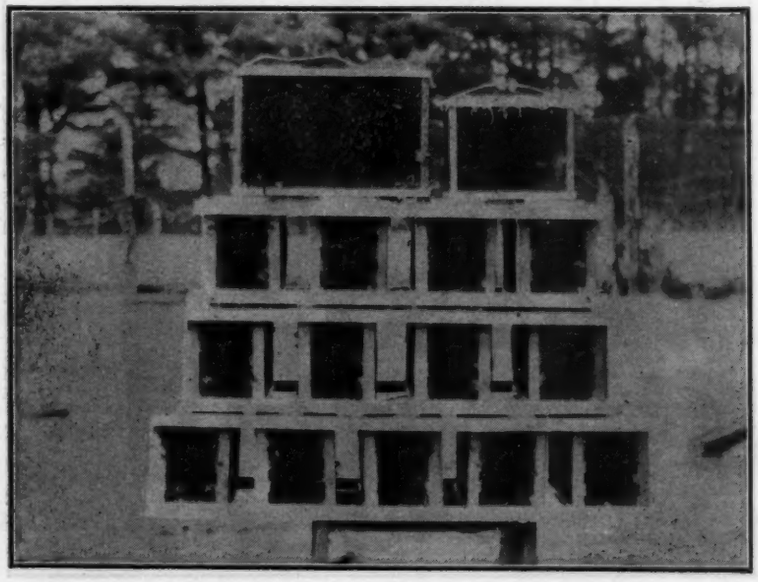
Fifty 3-pound packages delivered by parcels post cost $377.50, fed 300 lbs. of honey at 25c—$75, making total cost of $452.50, or an average cost of $9.05. These 50 packages gave a total yield of 7,552 lbs., worth at 20c per pound, $1,510.40, or an average of 151 pounds, worth at 20c $30.20, making a total net profit of $21.15 per colony, or $1,057.90 for the 50 packages. 1920 was an exceptionally good season. In all of the above experiments no brood or other help was given except in cases where the queen was missing, in which case a comb with small amount of brood was given to hold bees together until other queens would arrive.

You will note in all of the above that the original packages with such stores as they contained at end of season are not considered. During the first three years of my experiments with packages many queens were liberated in transit and many colonies found queenless later, and by keeping tab on conditions I discovered that nearly all losses of queens were where the queen had been liberated in transit. This led me to believe that since a newly introduced queen is apt to be balled if the hive is opened or disturbed too soon after introducing, that the missing queens were likely balled on account of being liberated while bees were in transit and being disturbed; so in the spring of 1919 I made a note when putting packages in hives of all cages where queens were liberated and, as I expected, found that nearly all queens liberated were lost. This led me in 1920 to request the shipper to fasten the queens in the small cages with a piece of wood or tin and place among the bees so that they could get acquainted, but not liberate her; and out of the 50 received all arrived alive, and only one got lost in introduction. I think this is a good stunt, and would advise shippers of packages to confine queens in cages so the package bees cannot let them out until after introduction in the hives. They should be placed in the package with the bees and close enough to the food so that the bees will not neglect them in case of cold weather, when it is necessary for the bees to cluster close to the stores.

I think a 3 pound package is much preferable to a smaller one, and if received two months before main honey flow, will equal the best home-wintered colonies, provided that they are given drawn combs, shelter and plenty of stores.

My method of handling packages is as follows: The hives with combs are placed on stands before bees arrive, entrances closed, and if 2-pound packages are expected, all combs are removed but 4, one of which should be full of honey. If 3-pound packages are to be hived, I place a box of combs on the top with one or more combs of honey for food, and see that no openings are left. When packages arrive they are taken inside where it is warm and fed all the thin syrup that they will take. (Syrup is made two parts water and one part sugar). They are then placed in a quiet, cool, dark place until evening. I like a temperature of about 60 degrees, as they keep nice and quiet then. In the evening, when it is too late for bees to fly, I take them to the hives, remove queen cage with the bees clustered on it and hang it between two combs near the top. The openings at both ends of large cage are opened, all food removed, and in the case of 2-pound packages, the package is placed in the hive alongside of the 4 combs, the first comb next the cage being the one containing the honey; replace the cover, open entrance so that one bee can pass out at a time and **leave alone for at least a week.** I always run a match through the candy in the queen cage so the bees will release the queens as soon as possible after hive becomes quiet. The 3-pound package is handled the same as the 2-pound except it is placed in the empty hive body under the box of combs, with one end raised up until it touches the bottom of the combs. After **one week** from the time bees were put in hives remove cages, note if all queens are laying, place a good tight chaff division board up next the fourth comb in the hives containing the 2-pound packages; see that there are no cracks or other openings to let in the cold air or, let out the heat; see that there is a wind protection and leave entirely alone for at least three weeks. **You can't overdo this leaving alone,** early in the spring, so long as you are sure they have stores and protection. The 4 combs will be all that they can use if received early. With the 3-pound colonies I remove the empty hive-body, place upper story with bees and combs on bottom-board and otherwise treat same as the 2-pound colonies, except that I leave all of the 8 combs in the hive. I use the 8-frame hive. When young bees begin hatching plentifully, more room should be given as needed, being careful not to give too much at once. From this time on, packages are given same management as home wintered bees.

Michigan.



Package bees as they go to the Northern beekeeper.

PRELIMINARY NOTES ON THE RELATIVE VALUE OF THE PHYSICAL FACTORS CONCERNED IN HONEY GATHERING.

By J. H. Merrill,

Apiarist Kansas State Agricultural College and Experiment Station.

(Contribution No. 67, from the Entomological Laboratory, Kansas State Agricultural College. This paper embodies some of the results obtained in the prosecution of project No. 126 of the Agricultural Experiment Station.)

The fact that some colonies in a beeyard greatly exceeded other colonies in the amount of honey which they stored during the honey flow, has long been known. Advice has been given to have all of the colonies strong before the honey flow, and that they be of as nearly equal strength as possible. Yet, even when this advice has been followed, it has been found that bees of the same race and of the same age, raised from queens bred by one breeder, differed in the amount of honey which they stored, even though the colonies were brought to as equal a strength as possible. In order to learn why these facts existed, the following experiment has been started at the Experiment Station of the Kansas State Agricultural College. While the results given here are not as conclusive as they would be after the experiment had been carried on a few more years, yet

some of them are so strikingly suggestive that it seems worth while to make them public at this time.

Just before the honey flow began, four colonies, numbers 5, 6, 7 and 8, were selected to be used in this experiment. The hives were weighed early in the morning, before the bees had started to the field, and then later the total weight of the hives and hive parts were subtracted from the weights taken earlier in the morning, the difference in the weights representing the number of pounds of bees in each hive.

For the purpose of this experiment, we estimated 5,000 bees to each pound, and in this way we were able to closely approximate the number of bees in each hive. In addition to learning the number of bees in each hive, the amount of brood was measured, and by allowing 5,000 bees to each frame, we were able to arrive at what we termed the potential strength of each colony.

The actual number of bees and the potential number are given in Table 1.

Table 1.—Number of Bees in the Fall and Spring

Hive No.	Actual No.	Potential No.
5	12,500	19,375
6	19,375	35,625
7	20,000	42,580
8	18,750	37,500

The reason for using the potential number of bees was to indicate whether any of the queens were lagging behind the others in brood-rearing. It will be seen that although hive No. 5 was not as strong as hives 6, 7 and 8, yet the difference among the three latter, both in the actual number of bees and the potential number, is very small.

Throughout the summer 10 worker bees returning from the field were captured daily at each one of the four hives, and when possible two daily collections were made. The bees were then taken to the laboratory, where each bee's tongue was measured, and the length recorded. The honey stomach was removed from each bee, and the nectar in each stomach was weighed and recorded. The tongue, the empty honey stomach, and the bee's body were then weighed in order that we might learn the relative weights of these bees with empty honey stomachs.

In the fall of the year, by the same system of weighing that we used in the spring to determine the number of bees, we again ascertained the number of bees in each hive. The total amount of honey in each colony was also learned from these weighings. During the summer, 720 bees were examined from each one of the four hives, and at the end of the season the average was taken of the length of tongues, the weight of the bees and the size of the honey stomach, and these averages were then compared with the amount of honey stored in each colony. It was found that hive No. 5, which had a potential strength of 19,375 bees in the spring, increased this number during the summer to 33,333, but in the length of its tongue stood fourth, and third in the weight of the bees, fourth in the size of its honey stomach, and had gathered 61⅜ lbs. of honey during the season, which entitled it to third place. Hive No. 6, with a potential strength of 35,625 in the spring, increased this to 43,540 bees by the fall. It had the second longest tongue, the second heaviest bee, but in its honey stomach, or carrying capacity, it far excelled any of the other three. It brought into the hive 116⅜ pounds of honey, which was the greatest amount brought in by any one of the four colonies. Hive No. 7 had a potential strength in the spring of 42,580. This was lowered in the fall to 41,250. It had the second largest honey stomach, but had by far the largest bees. It brought in and stored 74⅛ pounds of honey, which was the second largest amount stored. Hive No. 8 had a potential strength in the spring of 37,500 bees, and this was reduced by fall to 37,082. It had the third longest tongue, ranked fourth in weight, third in the size of its honey stomach, and as it only stored 53⅜ pounds of honey, it ranked fourth in the amount of honey stored.

The comparison of these figures shows that hives 6 and 7 were either first or second in the length of tongues, weight of each bee, the size of each honey stomach, and in the amount of honey stored. This suggests that the length of the tongue, the weight of the bee (or its size) and the size of the honey stomach may account for its honey-storing abilities. It would seem very probable that where the bees were gathering from flowers which had a deep nectary, that the length of tongue would be a very deciding factor. However, the bees gathered the honey this year from two main forces—alfalfa and sweet clover—and it is evident from the above figures that the tongue length was not the most important factor, but rather it was the size of the honey stomach which determined how much honey could be gathered during the season. When colonies No. 5 and No. 8 are studied, it will be seen that there was a difference of 8 pounds of honey stored, but the fact that colony No. 5 gained about 14,000 bees during the season, whereas No. 8 lost 500, would easily account for the difference in the amount of honey.

Table 2, showing the standing of each colony for the different points considered, is rather interesting:

Table 2.—Summary of Results

Hive No.	Actual No.	Potential No.	Fall No.	Length of Tongue	Size of Bee	Size of Honey Stomach	Honey Stored
5	4	4	4	4	3	4	3
6	2	3	1	2	2	1	1
7	1	1	2	1	1	2	2
8	3	2	3	3	4	3	4

This experiment will be continued over a number of years, and the results of each year will be compared in the hope that we can definitely decide just what it is that enables one colony of bees of comparably equal strength of another colony to store more honey during the honey flow.

PASTE FOR TIN

I have seen numerous inquiries in the American Bee Journal for a paste that would stick labels on tin. We have tried all kinds of pastes and glues that we could get hold of, but with poor success, until we tried pure gum shellac, such as painters use for covering knots. It sure does the work. It is not necessary to put it on so very thick, and only around the edge of the label. S. D. Mason.

Minnesota.

WAX FROM OLD BROOD COMBS

By F. Dundas Todd

Over a dozen years ago I spent a couple of weeks experimenting on a small scale with various methods of rendering beeswax from old combs. I fairly well satisfied myself that the weight of wax in four ordinary combs was about one pound, but I also learned that combs in which brood had been raised accumulated a surprisingly large amount of dirt, in fact, I found many old black combs that alone weighed a pound—75 per cent dirt and 20 per cent available wax. Furthermore, I found that the more dirt on the comb, the less of the available wax was secured by such ordinary methods of rendering as boiling in water, or heating in the oven.

This year, having had no honey crop, I had no cappings to melt down, but I had made a final roundup of old combs, principally on account of drone cells. Altogether I had 35 pounds weight of these, varying from very black to fainter hue, so I considered I should get not less than 9 pounds and not more than 12 pounds, that is from a fourth to a third, of wax from the mass. The actual return was exactly 11 pounds.

These days, when it is becoming more and more the custom to send old combs to the foundation manufacturers to be rendered, it is advantageous to know just about what one may expect to get in return.

A suggestive label used by a California beekeeper.

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THE EDITOR'S VIEWPOINT

Manitoba Beekeeping

Manitoba is coming to the front in beekeeping. The February number of the Western Gardener, of Winnipeg, contains a report of their Manitoba meeting, January 13. If Manitoba and the western provinces succeed well in honey production, there is room for fine apiaries there. Their next President is G. M. Newton. The Secretary is J. H. Kitley.

The wintering problem is the stumbling block for those countries, and Mr. G. F. West, of Medicine Hat, tells of the Chinook winds, which sometimes change the temperature in one day from -30 degrees to -|-50 degrees, a variation of 80 degrees. In cases of this kind, cellar insulation is difficult.

The Chinook wind, which descends the eastern slopes of the Rocky Mountains, is called "snow-eater." We know, through a correspondent in central Alberta, about the 54th degree, that wintering bees is very precarious there.

Mr. Baldensperger and A. B. J.

Perhaps the nicest compliment the American Bee Journal ever received was written by Mr. Baldensperger to us February 5. He was then at Pau, visiting with his daughter, a professor in the College. We quote from his letter:

"When the January number of the American Bee Journal arrived, I had been charged by my daughter to look after the dinner, as she was in her class. I don't pretend to compare my self to King Arthur, in charge of the cakes of the good woman, and which he burned or allowed to burn, but you put so much interesting stuff in that number that I jumped from one page to another; when a big smoke and smell brought me to my senses—the dinner was a dish of coals—all by the fault of that anniversary number, with the wonderful queen. My daughter was sorry, but she pardoned my absence of mind when she saw the number."

A Larger Journal

For several months past we have added a few pages to our regular size of issue as conditions would permit. This month we have added eight pages. It is our purpose to give our readers just as much as possible for the money they pay us in subscription. There has been a slight decline in the cost of paper from the high point of last yea.. It is still about four times the old price. However, as yet there is no decrease in the cost of printing, binding, engravings or other items that enter into the making of a publication like ours. We purpose to add new features as opportunity offers, and to put any savings from lowered cost of production into the making of a better Journal.

Advertising Honey

Since the Honey Producers' League proposes to advertise honey to increase its sale, for the benefit of the beekeepers, it is well for the honey producers to consider the matter.

Advertising is an expensive affair. Yet, it very clearly pays those who do it judiciously. Fortunes have been made in very indifferent products, by thorough advertising, and St. Jacob's Oil, Sozodont, Hostetter's Bitters, advertised fifty years ago, are still popular. Things as unimportant as Williams' shaving cream, Canthrox, Musterole, etc., are enriching their producers because they are spending tens of thousands in proper advertising. "He pays the freight," "His master's voice," and other advertisements, have become household words, because they have been repeated till the people became accustomed to them.

That advertising lasts a long time in its effects is, perhaps, not appreciated by the average honey producer. Let me give here a personal experience:

The Dadants have sent catalogs to beekeepers for about 50 years. In 1891, we began to send addressed return envelopes to the customers. We did it in a modest way, fearing the expense, but they brought back the returns. These first return envelopes were of a small size, easily recognized. Some of them still come back once in a great while, with an order. These have evidently been preserved by the customer, who finds use for them after 30 years! Is it worth while to advertise?

But there is an important question to this advertising. It is its cost. Perhaps some of those who are joining the Honey Producers' League think that all that will be required of them, in order to reap the benefits of thorough advertising through the League will be to pay a dollar a year through their State Association. This is only a drop in the bucket.

I firmly believe that we can maintain the price of honey at 4c above what it would sell at normally (without advertising), if we advertise it as thoroughly as the "Sunkist Oranges" are now advertised. If the American honey producers harvest and sell a hundred million pounds, annually, which is certainly below the mark, they would increase their income by four million dollars. Let us count it at a fourth of that, or an increase in selling value of one cent per pound, this will still make a bonus of a milion dollars a year. Can we afford to spend one-tenth of a cent per pound for this purpose? Figure it out for yourselves, you producers who sell 10,000 pounds of honey annually. Your share woud be a hundred dollars per year. You will need to spend it, in some way, either by advertising your own honey locally, or by joining others for this purpose.

What I have wished to bring out is: that we cannot expect success to fully crown our efforts as long as we grudgingly pay a $1 membership in an association and ask: "How soon is that $1 coming back to me with interest at five hundred per cent?"

The Making of a Bee Journal

We are always glad to get letters, articles and pictures from our readers, although it is impossible to use them all in the Journal. When an article is returned it should not be considered as a reflection either upon the article or upon the writer. The editors of any magazine worth while must read a great many more articles than they can possibly have room for in their publication. The more material the editor has to select from, the bigger variety he can give his readers and the more interesting his publication should be. The editors of some of the larger popular magazines have eight hundred or more manuscripts submitted each month, while they only use a dozen or two.

Some articles cannot be used because they are too long, some because similar material has already been accepted, some because they are of local interest only, some because they come at a time when the editor plans material of an entirely different nature, and many more simply because the editor cannot use more material than the number of pages printed each month will accommodate. It is often very hard for the editor to decide just which articles to print and which cannot be used. When he has a limited amount of space to fill and has several articles of equal merit, he can only guess which one will interest the greatest number of readers. Since the readers live under such a wide diversity of conditions and are composed of so many kinds of people, a good variety must be selected. The article that one

man will pass over without reading will be of great interest to another.

It usually happens that we send more matter to our printer every month than can go in. Some articles now in type have been standing for several months with the expectation of using them at once. When the forms are made up, the type matter must fit the space, and one article may be held over because it is too short and another because it is too long. The article that is just the right length to fit the space is the one that goes in at the last moment.

The principal articles are planned some time in advance of the appearance of the magazine. Our reading pages go to press on the tenth of the month previous to date of issue. All type must be set, proof be read and engravings made, before that time.

While it sometimes happens that we take out something already in type to make room for something of immediate importance, as a general rule articles are at hand several weeks before they appear in print. This does not apply to brief notices of conventions and news items that are included in the last forms, which go to press on the 20th of the month.

The last advertisements and news items go to the printer at least ten days before the Journal is mailed

The work of making a publication like ours must be distributed over the entire month, otherwise our help would be idle part of the time, and that would greatly increase the cost of publication.

Henry C. Wallace as Secretary of Agriculture

The announcement of the selection of Henry C. Wallace as Secretary of Agriculture in the new cabinet, meets with very general commendation. Mr. Wallace is well equipped for the work, having lived for a number of years on a farm, where he specialized in pure-bred stock. He is a graduate of the Iowa College of Agriculture and has been for a number of years the editor of Wallace's Farmer. He has the confidence and support of a large circle of admirers among both farmers and business men.

A Dangerous Bill

New York beekeepers should be awake to the dangers of a bill now under consideration in the State Senate which proposes "To regulate and prohibit the keeping of bees within village limits.' Such a law, while probably unconstitutional, would cause no end of annoyance to beekeepers of the Empire State and should be vigorously opposed both by the various organizations and by individual beekeepers. Let the lawmakers know that such a measure will be very popular.

A Missouri Bee School

A three-day bee school will be held at Benton, Mo, from April 4 to 7 A good attendance of beemen from Southeastern Missouri is expected and an interesting program is being arranged. L. A. Schott, of Benton, is the Secretary of the local association and will furnish further information on request.

C. C. Miller Memorial

Regarding the subscriptions of beekeepers to the C. C. Miller Memorial Fund, it is desired by the Committee to secure at least $5,000 to establish a scholarship bearing this name, using only the interest of the money gathered, annually through a trustee committee, for a scholarship in beekeeping and allied sciences.

Although it was first suggested by Gleanings that the subscription be limited to $1, it has been decided not to put any limit upon the amounts to be accepted, but as small a sum as 25 cents will be welcome.

The members of the Committee, named below, will receive the funds. All the amounts will be acknowledged in the American Bee Journal or Gleanings, or both.

It is desirable that the greater number of subscriptions be forwarded by the subscribers before June 10, at which date Dr. Miller would have been 90 years of age. It behooves the beekeepers of America to thus celebrate the anniversary of this great man, who is acknowledged by the beekeepers of the entire world as one of the most deserving members of the craft.

We shall be glad to have the other bee magazines lend a hand in this and publish such lists of subscriptions as they may be able to secure. If all pull together, we should secure a worth-while sum. Send subscriptions to:

B. F. Kindig, East Lansing, Mich.
E. G. LeStourgeon, San Antonio, Texas.
Dr. E. F. Phillips, Bureau of Entomology, Washington, D. C.
E. R. Root, Medina, Ohio.
C. P. Dadant, Hamilton, Ill.

Injurious Insects

I wrote some time ago of some interesting works in entomology. At that time I had not yet read Professor Conradi's book entitled "Farm Spies." It is written for the South, with the collaboration of Prof. W. A. Thomas. It treats of injurious insects, such as boll-weevil, the grasshopper, the chinch bug, and ought to be read by every farm boy in the Southern States. It is well illustrated and ought to be worth five times its cost to any cotton or corn producer in Dixie. As our readers know, A. F. Conradi is Professor and Entomologist at Clemson College, South Carolina. He also teaches beekeeping.

Damages From Germany and Good Samaritan Fund

Our correspondents inform us that there is at last a likelihood of obtaining reparation of some of the damages inflicted by Germany, in the apiarian line, as follows:

Belgium: 1,000 honey extractors, 1,000 wax rendering kettles, 500 Rietsche wax foundation moulds, 2,000 bee smokers.

France, 60,000 straw skeps, with bees, to average 35 to 40 pounds each. All of this is to be supplied the coming fall, 3 years after the armistice.

We were asked at what price the U. S. beekeepers could furnish colonies in straw skeps? Do our subscribers know of any? We don't

Very few of us realize how much suffering there is yet in the devastated regions.

By the way, we have a small amount to add to the Good Samaritan fund:

February list	$12.00
John Desmond, Milwaukee	2.00
L. C. Hartman, Lassen, Calif.	1.00
J. E. Keys, Frankfort, Ind.	2.00
Total	$17.00

Flora of France, Belgium and Switzerland

One of the finest works, or perhaps the finest, ever issued on botany is the "Flore Complete" of Gaston Bonnier, the publication of which was delayed by the World War. Three volumes have been issued. The fourth will be out this month, and the printing on the matter of the fifth has begun.

In the three volumes which have reached us, 950 different plants have been described, with color cuts. In some cases, as many as 16 different varieties are reproduced in colors.

As an instance of the completeness of this work, we will say that Melilotus is described under genus 175. Ten varieties of it are described, with 15 color cuts. Four sub-varieties are shown.

Should any of our readers wish to secure this immense work, which will probably not be complete in less than 10 volumes, we will gladly send them information. The cost, at present exchange rates, is about $8 per volume. The text is in the French language.

Who Should Keep Bees

In the same mail with the article by Mr. Skow, given on page 136, we received another advising every farmer to keep a few colonies of bees. We believe this would be a great mistake. No one should keep bees who does not actually enjoy working with them. The greatest hindrance to success by the average beekeeper comes from the man who owns bees but does not care for them. It is exactly as in orchard growing. The man who has only a few apple trees or peach trees and lets them go haphazard is producing injurious insects for the careful orchardist to fight. If you are not going to take care of your bees, sell them to some one who will, and buy your supply of honey from him.

California Meeting

Mr. Cary W. Hartman, President of the California State Beekeepers' Association, reports that the March meeting at Oakland was the best, in every way, in the history of the State Association. May they have many more meetings as good as this one.

QUEENLESS BEES AND DRONE-COMB

The photo of a sheet of foundation upon which irregular drone-cells were built, by a queenless colony, indicates why the beekeepers of the old days thought that the queen directed and ordered the work. When we compare the work of a normal, queenright colony, with this, we feel very much inclined to believe that the work upon this comb was done without order, without control. It seems as if the work was begun at different spots at the same time, so that the joints were irregularly formed. They appeared to have felt the need of drones. Yet of what use would drones be to them in such an occurrence? When we witness such work, such waste, we can readily agree with Fabre, who tried to explain nothing, in the actions of insects, leaving only, as he said, "a big interrogation point."

Under ordinary conditions foundation insures worker combs.

INFLUENCE OF THE DRONE

By Alois Alfonsus

Editor des "Bienen Vater," Vienna, Austria.

Translated from the original manuscript by C. W. Aeppler.

Breeders of dairy cows have learned from experience that the inheritance characteristics of the sire are more pronounced than those of the cow. If a certain sire is descendant from a cow that has established a record in milk production, this sire would possess the characteristics of high milk production in a very much higher degree than would a cow descending from the same mother. Also, it has been found that certain sires, born from exceptional milk-producing cows, inherit these milk producing characteristics to a remarkable degree. It has been found that daughters of such sires produce 1,000 liters of milk per year more than their mothers.

Undoubtedly somewhat similar conditions exist in the case of bees, inasmuch as the Mendelian law of inheritance is also operative. Dzierzon has proved to us that a drone is not related to the drone that mated with his mother, but to the drone that mated with his grandmother. Therefore, the inheritance characteristics of a drone cannot be disregarded.

In every apiary there are a few colonies that stand out above the others in honey production. These colonies can be utilized in rearing the bulk of the drones in the apiary. At the same time every effort should be made to prevent the rearing of large numbers of drones in the other colonies.

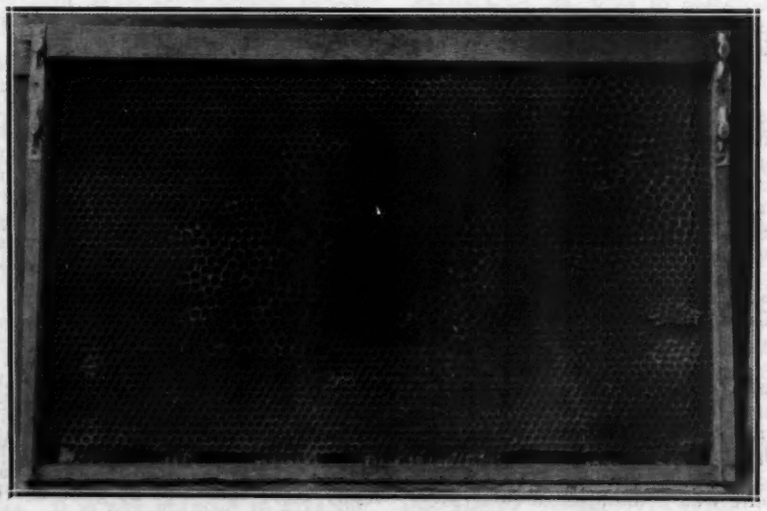
Several drone-combs should be given to these chosen colonies. As soon as the combs contain young larvæ, they may be given to other colonies. Even though so distributed they contain brood from the chosen queens. It would not do to distribute combs with eggs only, inasmuch as the workers might remove them, if the colonies were indisposed. However, one must not believe that colonies that are used in this way will yield no surplus honey. It has been established by Professor Dr. Zander at the University of Erlangen that such colonies may give as much surplus honey as any. To begin with, they possess exceptional honey-producing qualities, and while they might produce more honey if the queens were not allowed to fill several drone-combs, this sacrifice must be made to secure the good drones. Even so, the sacrifice is not as great as might be expected with these exceptional colonies.

During the past 20 years, systematic breeding of queens has been going on in Switzerland. All over the land there are observation stations. In 1918 and 1919 an extensive experiment was carried on. The production of 1,500 colonies, headed by queens from selected breeders, was compared with the production of 1,500 colonies as ordinarily found over the country. The experiment was conducted with the greatest possible care under expert supervision.

The season of 1918 was a good one, and the well-bred colonies produced an average of 72½ pounds per colony; whereas the others yielded only 52½ pounds per colony.

The season of 1919 was a poor one, the well-bred colonies yielding 10 kg. and the others 8 kg per colony. With honey worth 6 Fr. per Kg., the well-bred colonies yielded 36,000 Fr. more in 1919, and 144,000 Fr. more in 1918 than the others.

Every beekeeper cannot be a queen breeder. However, every beekeeper can practice the rearing of select drones. In time the quality of the drones in his apiary will be better, with the result that his profits will be increased.



Drone-cells built on worker foundation by queenless colony.

AN APPEAL TO THE MANUFACTURERS OF BEE SUPPLIES

By Allen Latham

Since receiving the 1921 catalogs of bee supplies I have been doing some figuring. The results of this figuring foretell the doom of comb-honey production, unless the industry is rescued through the invention of cheaper supplies for the comb-honey producer. Sections, cartons, shipping cases, are now so costly that one cannot produce and market a first-class crop of comb honey and make a profit. Look at these estimates, most of which are under rather than over the mark. Follow a section of honey from producer to consumer.

Item.	Cost
Section	2 cents
Foundation	1 cent
Labor of preparing	½ cent
Percentage of loss	2 cents
Carton	3 cents
Labor of marketing	1 cent
Share in shipping case	4 cents
Overhead	½ cent
Total	14 cents

By percentage of loss I refer to broken sections of honey, to unfinished sections, to poorly finished sections, etc., an item often overlooked in comb-honey production.

In regard to cartons. One can get along without them, but it is not fair to the consumer. Dusty sections of honey will kill the trade also, and all will concede that we should not get along without cartons.

The overhead charge is merely that of buildings, machines, insurance and the like. It does not take into account the labor of the bees. No account of this last item is taken at all.

Item	Income.
Wholesaler	2 cents
Retailer	6 cents
Producer	3 cents
Total	11 cents

11 plus 14 equals 25.

These last figures are assuming that the section retails for 25 cents. Assuming it to retail for 30 cents, these figures meet that price.

Item.	Income.
Wholesaler	3 cents
Retailer	7 cents
Producer	6 cents
Total	16 cents

14 plus 16 equals 30.

It will be seen from these figures that a producer of comb honey gets a return from $3 to $6 for every hundred sections of honey he produces.

This is a return that is prohibitive. Few localities exist that would warrant a man's undertaking to produce comb honey for such returns.

It may be argued that I have given too low a figure when I offer 25 and 30 cents as the retail price for a section of honey. True, we have been getting from 40 to 75 cents for a section of honey. If those prices were to hold it would pay well to produce comb honey even with the present cost of supplies. Unfortunately, those prices are not going to hold. I am confident that comb honey will not move in the fall of 1921 at over 30 cents per section. It is now a very slow seller at 40 cents in many markets. Only the fact that the market is low renders this price possible. If comb honey were abundant the retail price today would come down to 30 cents, or the honey would stay on the shelves and counters of the stores.

I do think that we shall be able to dispose of our comb honey next fall so that it will retail for 30 cents, provided the grade is good and sections well filled. Off-grade sections will not bring that sum.

How, then, are we to meet this contingency? Shall most of us stop the production of comb honey and let it become altogether an article of luxury, to be sold at a high figure to a few consumers who can afford to pay for it? Or shall we cut down the cost of production and marketing so that an average person can eat comb honey if his palate demands it?

Two items at least can be cut down in the expense sheet. Cartons will be made for less, and should before next fall come down to 1½ to 2 cents each. Shipping cases can be made for far less than they are listed. Lumber is high. Use a substitute. Several makes of wall board would serve well for bottom, sides and top of shipping cases. I can make shipping cases for my own use for less than half the listed price, and they will be well made, too.

I urge the manufacturers of bee supplies to come to the rescue and get out **cheaper forms** of shipping cases, and if possible to cut the cost in other items connected with comb-honey production. Let us not allow comb honey to become altogether obsolete.

Connecticut.

(When Mr. Latham's article was received it was referred to Mr. Hawkins, of the G. B. Lewis Company, for reply. We believe that both the beekeeper and the supply dealer should be heard. The following is the supply dealer's side of the case.—Ed.)

Why Supplies are High

A reply to Mr. Latham by Kennith Hawkins

Sections and shipping cases are higher in price than they should be. It is not our desire that they should be, for when prices of containers are too high to allow the honey producer a fair margin of profit on his product, the sales by the manufacturer are reduced to a figure which does not warrant the heavy investment in buildings and machinery.

It is not possible to sell beekeepers' supplies below present prices when the prices are based on lumber and labor at the costs to us which entered into the goods we are now selling. Prices of supplies were not advanced early in the season of 1920, although nearly all other lines were advancing. Beekeepers' supplies were not advanced in price at that time because we gave the beekeepers the benefit of prices based on raw materials bought at lower costs in 1919. When these were exhausted, prices on beekeepers' supplies had to be advanced to provide an industrial living. While present indications point to lower prices on most items for the season of 1922, it is not possible to reduce prices at this time.

This company maintains that supply prices have always been higher on some items than they should have been, and that this may be charged to the beekeeper we will try to show in this statement.

The producer and shipper of comb honey is to blame for the higher cost of shipping cases, because he demands a **show case** in which to ship his produce instead of a simple container designed to carry the contents to the retailer in proper condition.

The name "shipping case," as applied to the article furnished today for the shipping container for comb honey is a misnomer. A "shipping case," so called, constructed as it is demanded by the beekeeper, of absolutely clear lumber, and with a glass front, is nothing more or less than a show case, pure and simple. If this article were listed in bee supply catalogs under the correct heading of "show cases," the prices listed today would be low.

Why should the producer furnish the retailer with a show case for every 24 sections of comb honey sold? When the retailer has sold the honey, the case is most frequently scrapped. Retailers are not continuously furnished show cases gratis with other articles they sell, even jewelry.

In securing a new customer, it would be good business to furnish him gratis with two or three of the glass front show cases, for display purposes, but why continue to do this with every 24 sections of comb honey?

A change in the shipping container for comb honey should be made, and is no doubt necessary. If such a change necessitates a change in the standard package size, such a change will have to be made. An old rule is of no use whatever if it does not meet present day conditions. Mr. Latham suggests a substitute for the present shipping cases. This would be very easy for us. Has Mr. Latham the power to force beekeepers everywhere to change their standards of grading honey and to get them to accept such changes? This requires concerted effort by American beekeepers. We will welcome the advent of this change.

A similar proposition confronts the manufacturer in the matter of sections. The grading rules require white sections. This is unnecessary. We agree that sections are too high, and no one regrets this more that the G. B. Lewis Company, whose men invented the one-piece section honey box. Section prices are based on basswood lumber, which had to be bought under contract in 1919, or very early in 1920 for 1921 sections, at prices then prevailing Such lumber can be contracted for today at less, but is being cut in the woods, and will not be fit for sections until the present season is practically over.

All this is because the beekeeper insists on a white section. Honey tastes as sweet and could be sold as well in a brown basswood section as in a white one. If we did not have to throw out the brown basswood, which frequently runs as high as 40 per cent of the stock, the cost for material would be less. To consume this brown stock, it is necessary to figure it at less than cost, disposing of it at a loss as best we can, in one way or another, and which procedure, of course, increases the cost of the white, in order to make the average equal the original cost of the stock as received.

Hence the beekeeper has to pay for what he insists upon. Until the grading rules for comb honey are changed, and they should be at once, we cannot help much in that respect. We make what the beekeeper insists upon, and in some such items, those who have made the grading rules have not asked the advice of the manufacturer, who knows costs, and frequently a poor choice was made.

Many minds are better than a few. We welcome constructive criticism like Mr. Latham's, and we have the facilities for experimenting. Most suggestions we get are useless because they do not take the quantity manufacturing problems into consideration, or the beekeeper demands more for an idea than the profit on the article over a period of several years.

The G. B. Lewis Company has experimented extensively during the past winter with other kinds of wood than basswood for sections. We have found some that would make cheaper sections, which look just as good as basswood, but the wood could not be purchased in required quantities. In others, the percentage of waste wood ran too high. Consequently, the quickest relief is a change in the grading rules, and to continue to use basswood, which is available.

Mr. Latham wisely suggests an alternative, if supplies will not cheapen in price this season, of decreasing the cost of producing and marketing honey. Put yourself in the supply manufacturers' position. Suppose we did no advertising? Suppose we did not buy in advance of our raw material needs for each season? Suppose we made our goods and then let some one else sell them at little profit to us? These points can be remedied in the production and sale

of bee products and will fit in as suggestions along with Mr. Latham's ideas for the consideration of the beekeeper who is willing to try to help himself.

The present honey grading system of American beekeeping is at fault and beekeepers should get behind some national body which can change the honey-grading rules, and bring them up to date, which can advertise to create a demand for honey because it is honey, and not because it is a substitute for something else, or because it is being pushed as a luxury. The American Honey Producers' League is attempting to do this. We do not say they alone will succeed, but we will work with them as long as they honestly try to help the beekeeper.

TOO MANY BEEKEEPERS

By Oscar Skow

Too much can be said in the farm papers and on the street corners about how much money there can be made from a few stands of bees. This creates a class of beekeepers who think that great wealth can be accumulated without cost or labor.

Consequently they will produce two or three hundred pounds of honey in box hives, without much cost or labor, and as a rule will sell their crop at whatever they can get, and establish a price with which the professional beekeeper cannot compete. Thus, for the last three months I've been unable to sell a single pound of honey in the neighboring towns, where I used to dispose of a good deal of honey . Consequently, I've had to seek a different market. When our professors and lobbyists also get these distant territories covered by novice beekeepers, where will the professional with his large crop dispose of his honey?

It would be much better, I am sure, if the professor and others who seem so determined to increase honey production would help the fellow who has already produced heavy crops, to find a legitimate market.

Iowa.

(There seems to be a general impression that there is a large increase in the number of beekeepers in this country. The census shows the contrary to be true in many States. The fact of the matter is that with the general teaching of better methods hundreds of beekeepers of the class mentioned are going out of business. The work of the colleges instead of attracting a large number of irresponsible people to take up honey production is having the opposite effect. The fellow whose only interest is in finding a snap does not listen to one of these college professors very long until he decides that beekeeping is entirely too difficult for him.

It is true that more honey is produced than in the past, but it is produced by fewer and better beekeepers, who use better methods. The colleges are making a study of the marketing problem and doing much to assist in extending the market for our product. This is a free country and there is nothing to prevent a man from engaging in beekeeping if he wishes. Neither is there any way to prevent him from selling his honey below the cost of production if he will. It is far better to make good beekeepers of those who engage in the business, and this the colleges are doing.

We quite agree with Mr. Skow that too much loose talk about the easy profits in beekeeping may do some harm by starting men to keeping bees who are not fitted for the work. Such however, will not last long.—F. C. P.)

A SUCCESSFUL CALIFORNIA APIARY

By Bevan L. Hugh

The photo showing the mountain scene is remarkable in view of the record made by the bees last summer. Lyle Robertson had 100 colonies of bees and decided to make his living with their aid, so in the spring of 1919 he divided the 100 and introduced 100 virgins to the 100 increase. He rented the whole 200 in orchards, and by the time he moved the outfit to the sage he had 200 strong colonies. Weather conditions and everything else favored him, so that he was able to get 26,000 pounds of honey. He took off a super a week from each colony while the honey came in, and at the end of the season he was making preparations to divide the 200 to 400 colonies by giving laying queens. He made over $6,000. The picture shows a view of his mountain yard. There were two other yards in these mountains near San Jose in nearby canyons, both owned by Mr. Robertson. His only helper was his life partner, who wielded a hive tool and puffed a smoker as well as anyone could. His good wife helped in the extracting, moving and everything else about the yards, in addition to cooking for the household, for they have two healthy youngsters, a boy and a girl. Mr. Robertson, prior to keeping bees in earnest, operated a truck, but now he uses the truck in moving his bees, and he finds that there is more money in bees than in trucking. After the season's work in the Santa Clara Valley the beemen take their guns and hunt ducks and quail in the swamps and mountains.

A California apiary which produced $6,000 worth of honey last season.

DADANT SYSTEM OF WINTERING BEES

Reply to Mr. E. A. Burdick by Dr. D. W. Gibson

On page 65 of American Bee Journal for February is an able paper under above title. The paper is clothed in pleasing rhetoric in treating the negative of outdoor wintering in packing cases. With the consent of Friend Burdick I will ask the privilege of presenting the positive side of the method.

Having just re-read the Dadant System of Beekeeping, I failed to find therein adverse principles to those which I tenaciously adhere to. This is a neat little volume of 115 pages full of constructive information, which is carefully read in some three evenings, and each progressive beekeeper can ill afford to be without it. I heartily subscribe to the large hive doctrine, the difference being that I insulate and the author does not. When one adopts the use of the packing case, and specially if one insulates the brood-chamber all year, the 10 frame Langstroth hive at once becomes too small for the size of colonies produced. The proper use of the packing case will greatly assist the beekeeper in raising his bees before and for the harvest, and not upon the honey flow.

Now it is distinctly understood that Friend Burdick and I are merely treating opposite sides of the question of insulation; his contention being that it is a disadvantage and mine being that it is an advantage.

He speaks of the theory of the packing case being based upon the erroneous idea that it will provide a steady warmth. Technically, neither the packing case nor the insulation provide the warmth, but **conserve** is the word. The bees provide the warmth, and the insulation is used simply for the purpose of conserving the animal heat and maintaining an even temperature. My consideration is not confined to any one kind of packing material, sawdust having been mentioned, but to the various insulating materials used by those following the method.

In saying "They are small ice boxes" he fails to recognize the fact that the function of the ice box is very different to the function of the insulation. The ice box is made to exclude heat and maintain a low temperature of mere inert matter void of life and without the ability to raise or lower its own temperature. The insulation serves as a sort of balance wheel or

kind of god-father to protect the cluster from the inclement rigors of winter which prey upon and in many cases sap the last atom of warmth and vitality from the cluster.

In saying the cold gets in slowly, and out more slowly, it must not be forgotten that there is no frost nor frozen material nor moisture in nor about the packing case. The ideal packing material would be of a porous, dry nature, and a good non-conductor of heat and cold, and one that will exclude as nearly as possible all the air from between the hive and packing case. Right here lies the secret of success of insulation, in using a material that excludes most of the air and yet is a good non-conductor of heat and cold. Exclusion of air from insulation prevents fluctuation of temperature. When all conditions are right the insulated colony will have all hive walls and cloth cover dry enough that you can strike a match upon them any day in winter. It is but little short of crime to leave bees exposed to the inclement rigors of winter so they will be forced to fairly drench themselves with moisture from respiration, from laboring so hard to keep warm. This condensed moisture given off from cluster while violently exercising will saturate their cloth cover, combs and inner cover of hive and often run out of hive and make a puddle on the ground. This damp condition within the hive is hard on bee life, the same as it would be on people. When kept warm, their quiet state of rest prevents moisture formation.

In missing an opportunity for flight I must say that my findings have been different to that of Friend Burdick. My bees are comfortable and easy every hour of the winter, and when the sun shines out warmly they are ready for a good voiding flight. Theoretically, he may be right in saying bees come out more readily from the single-wall hive than from the packing case, but the reasonable application of science has proven the ideal wintering conditions to be where they approximate that perfect state of quiescence, for in its last analysis, good wintering means nothing more nor less than the nearest possible approach to absolute quiescence. Seldom, if ever, does a month pass in this State without a flight from packing case, but possibly it is because our bees are of a rustling kind, though I doubt it. It is alleged that the packing case keeps them hidden away so far from the light that they miss their voiding flight on many nice days; but take it from me that you can trust them for that. You can no more keep them indoors on a suitable day than you can keep a bunch of children in the house on a fine warm day after a bad spell of weather. In fact, we feel that our bees fly more than is necessary in winter when there is several inches of snow and when things are frozen hard. It is just possible that some folks may have lazy bees; if so, better change the strain.

Relative to brood-rearing out of season, we have never noticed one case where there was much brood before there was natural pollen available, and from then on there has always been a regular development of brood, unless something out of the ordinary prevented.

As to the neighbor whose bees wintered poorly from insulation, some essential was neglected, and proper conditions did not obtain. It is difficult to get things just right the first time, and a person seldom makes the same success at first as later by experience.

The atmosphere within the hive must be dry, fresh and pure, and yet maintained at an even temperature which will give the bees comfort and ease with a minimum cluster temperature of 57 degrees and a maximum of not much above that. If there is any way to obtain this in cold climates without some form of insulation we are anxious to get the formula. The cellar is one form of insulation, also a number of other methods are in use, but **insulate** you must for best results.

The bare gunnysack alone for winter compares with a warm cloth cover with 12 or more inches of warm, dry insulation on top of it, similar to a man sleeping under a sheet in zero weather, while the other fellow is snugly covered with sufficient blankets to keep him comfortable, or with the modern "Seemore" ball gown compared with the comfort of a sealskin overcoat. In each case one generates and gives off as much heat as the other, the difference being in the conservation of that heat

Actual experiments of science have proven that a wind blowing 20 miles an hour will blow through a 13-inch brick wall, and due to this fact it is unreasonable to claim that in zero weather bees will be comfortable within a one-inch wall, and some with cracks and holes in them.

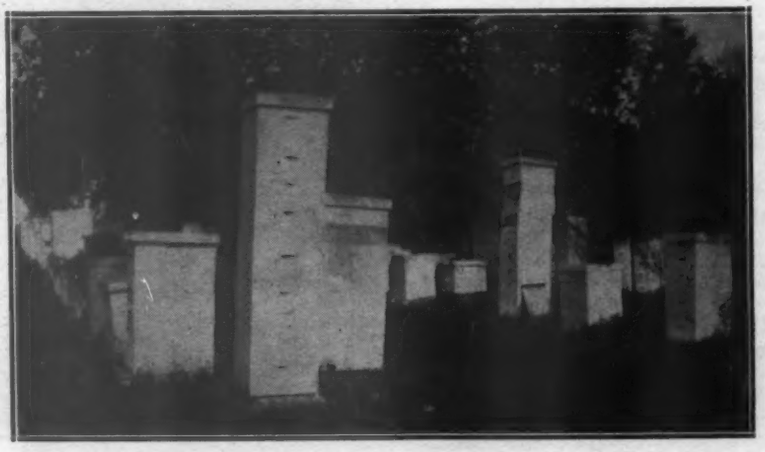
One pound of honey will produce 1,485 calories—the calory being the unit of heat required to raise the temperature of one gram of water 1 degree C. This means that the pound of honey will produce enough energy heat to raise the temperature of one gram of water 2,673 degrees F., or raise the temperature of 2,673 grams of water 1 degree F. Take 45 pounds of honey for the average colony—this being the amount recommended by the Bureau of Entomology—and when consumed you will find the colony has generated and given off enough energy heat to raise the temperature of 120,285 grams of water 1 degree F. In view of this fact I fail to understand how a man thoroughly grounded in theory and practict can consistently claim that it is not beneficial to conserve all this animal heat for the comfort of the cluster.

It has been proven through scientific experiments that live stock will reap as much benefit from 2 pounds of food when they are warmly housed as they will from 3 to 4 pounds when kept out in bad weather. Then does not the same principle hold true with bees?

Were it not impolite and lacking in courtesy, I would say that the claim that insulation is a refrigerator that keeps bees chilled and causes heavy losses is a fallacy, for in reality this fallacious statement is harmful to the undecided man who is earnestly casting around for a better method to tide him over the winter losses. No theory is stronger than the actual results it will give through scientific experiments.

I have been making experiments with wintering some colonies in cellar, some in packing cases and some on their summer stands unprotected. As a rule those in cellar and those outside do not vary much in final results, while those kept insulated all year give a marked advantage over the ones taken out of packing in spring, and the ones in packing case from fall to spring do better than the cellared bees.

It must be remembered that the details of insulating can not be carried out in the same manner in all localities. In a dry region you may put your insulation directly on the ground, being careful to prevent all moisture from getting under, but in a region of much precipitation the packing case must be raised well up from the ground. One can insulate anywhere where hay or forage will keep dry in the barn, but in exceptionally humid



Some colonies produced 300 pounds of clover and basswood honey in the apiary of F. J. Thurn, Edgewood, Iowa, in 1920.

sections it may be a failure. The first cardinal requisite is that there must be absolute dryness or else your insulation will be a failure. The individual must be able to meet the exigencies of the time and place and conditions.

Utah.

(From the foregoing article the reader should not get the impression that the Dadants do not use winter packing. They pack all colonies wintered outside, with dry leaves, held in place with wire netting. They do not use wood packing cases, because of the high cost and because with 800 colonies the labor of packing is much greater than by their present method. —F. C. P.)

THE ORANGE AS A SOURCE OF NECTAR

By Frank C. Pellett

In the markets of America, orange honey is famous for its high quality. Of light color, heavy body and fine flavor, it is much in demand. Usually the buyer is willing to pay a premium over prevailing prices in order to secure it. Since the area where oranges can be profitably grown is confined to limited regions in California, Florida and the Gulf Coast, it can never be produced in such quantities as is honey from alfalfa or the clovers.

Under favorable conditions, orange trees yield nectar so freely that it seems almost impossible for the bees to gather it all. As high as 400 colonies are kept in a single yard where there are large orange orchards within reach, and the average is often 60 pounds or more per colony. In the interior valleys of California the nectar flow seems to reach its heaviest yield. Not only does the orange yield more freely in the interior than along the coast, but the crop is much more dependable. Along the coast the fogs are unfavorable and the orange flow is much lighter and very uncertain. In conversation with the beekeepers, located near the groves of Satsuma oranges, along the coast of Mississippi, I learned that they did not regard orange as of much importance to them, except under unusual conditions. Likewise in Florida, where climatic conditions are different, orange is much less important than in the California valleys already mentioned. There are small orange groves in the Rio Grande Valley of Texas, but as yet there are no areas comparable in size to those of California.

At Visalia, beekeepers report that the flow from oranges is so heavy that the clothing of men and harness of horses engaged in cultivating the groves become saturated with it. Some years it lasts three weeks or more.

The extent of the flow can be best understood from the results obtained by individual colonies. A Tulare County beekeeper stated that he extracted 171 pounds of honey from one colony in ten days' time. He had previously extracted 24 frames of honey, from this same colony, that had not been weighed. This probably amounted to more than 100 pounds. Another beekeeper who moved his bees to the orange orchards was troubled by drifting when the bees were released. This made some very strong colonies, while leaving others weak. Some of these extra strong colonies stored four full-depth supers in four days. While these were exceptional cases, they do show what could be done generally if all colonies were strong at the beginning of the orange flow.

In visiting with the beekeepers of California, one finds two plans for utilizing the orange flow. One class of beekeepers count on building up their bees ready for later flows from other plants. The other class winter their bees with a big reserve supply of stores and count on getting the bees into condition ahead of the flow so as to harvest a good crop from the orange. Since the orange flow usually comes early in April it requires some attention on the part of the beekeeper to get his bees into proper condition sufficiently early to make the most of the orange crop. I found beekeepers who extract everything possible in the fall, leaving only enough to carry the bees through the winter. This plan makes it impossible for the bees to start heavy breeding early. On the other hand, some beekeepers count on leaving at least 50 pounds of stores with each colony and sometimes more, to insure early brood rearing. This latter plan usually brings a big return from the orange crop and leaves the beekeeper in equally good shape for the later flows.

There are few good locations in the best orange territory in California where the bees can be kept in the same location with profit throughout the year. In many cases the bees are moved several times to secure crops from several different sources.

Orange blossoms. (By Florida Photo Concern.)

THE RELATION OF BEEKEEPING TO FRUIT GROWING

By Dr. A. L. Melander
Entomologist, State College of Washington

Bees have long been known to be of value in pollenating plants, but just how far fruit trees are dependent on bees is not so thoroughly known to the general fruit grower. A number of carefully conducted experiments have been recorded in various bulletins and reports from which the following citations have been gleaned:

Different varieties of fruit are either self-sterile or else partially self-sterile. In the first instance, bees or other agencies for the transfer of the pollen grain are an absolute essential if the fruit is to set at all. In the second instance, where flowers are only partially self-sterile, a full crop of fruit would not result if all insects or other agencies for the transfer of the pollen were eliminated. In the third instance, of complete self-fertility, there are abundant records to show that crossing produces better fruit. Hence, in every case the fruit grower will profit by having bees in his orchard. In no case are bees detrimental.

Among the varieties of apples that are known to be self-sterile are the Arkansas Black, Gravenstein, Gano, Jonathan, King, Mammoth Black Twig, Missouri Pippin, Rome Beauty, Rhode Island Greening, Transcendant Crab, Wealthy, Winesap, Yellow Belleflower and York Imperial.

Among those only partially self-fertile are included the Ben Davis, Spitzenburg, Wagener and Yellow Transparent.

Among those that are self-fertile are the Baldwin, Grimes Golden, Dutchess of Oldenburg and Yellow Newton.

Experiments conducted by the Oregon Experiment Station have shown that while the Spitzenburg is regarded as partially self-fertile, it produces only 3 per cent of fruit when self-pollenated, but when receiving pollen from the Arkansas Black it will set 70 per cent of its fruit. Similarly pollen from the Ortley, Jonathan, Baldwin or Red Cheek Pippin produces a heavy set on Spitzenburg, while pollen from the Yellow Newton produces only about 40 per cent set. Such experiments are the result of hand pollenation, but are indicative of what would happen when bees visit from flower to flower.

Other varieties of fruit show a similar variation as to fertility.

Most pears require cross pollenation, since they are only partially, if at all, capable of setting fruit when self-fertilized. The California Experiment Station has demonstrated that plums and prunes will present a vastly heavier crop when cross-pollenated, both being more or less self-sterile.

Of the cherries, the Royal Ann, Bing, Black Tartarian, Lambert and Black Republican are self-sterile. Thirteen varieties of almonds experimented with at the California Experiment Station were wholly self-sterile. Peaches have also been demonstrated to be almost entirely dependent on the visits of bees if a good crop is to ensue.

Of the smaller fruits, raspberries, blackberries, strawberries, cranberries, etc., are all abundantly visited by bees, and the amount of fruit that would set is entirely proportional to the number of visits.

The question of the distribution of pollen by wind has been settled at the Oregon Experiment Station by fastening slips of vaselined glass in and near apple trees. So few pollen grains were caught on the sticky glass as to prove conclusively that wind is not at all an agency in carrying across apple pollen grains from one flower to another.

It has been proved that if blossoms do not receive pollen grains they fail to set. This is the main explanation for the familiar "June Drop."

It requires one pollen grain for each seed, five pollen grains must, therefore, fall upon and enter each apple flower, while the strawberry or raspberry would require many more grains.

When a pollen grain falls on the sticky stigma, the female part of the flower, it starts to grow down a tube carrying the sperm cells into the innermost parts of the blossom. The union of a sperm cell with an egg cell starts the growth of the seed. Unless all seeds are started, the fruit becomes misshapen in its growth, if it does not drop entirely from the tree. Hence, a complete pollenation with healthy viable pollen is the first requisite in the setting of a fruit crop. As shown in the preceding page, some varieties of pollen seem to be better adapted than others in insuring a complete fertilization. Even in case of self-fertile varieties, pollen from other blossoms, or better from other trees, or perhaps better still from other varieties, is needed for best results.

It is interesting to note that, contrary to popular opinion, pollen grains do not affect the color of the apple. A Spitzenburg pollenated by an Arkansas Black is no darker than if pollenated by a Newton, but many more apples would set from the Arkansas Black pollen than if the pollen were obtained from a Newton tree. The former polen is more effective, more likely to start the complete production of seeds, hence the result is larger and better formed apples, even though the color is not affected.

Many millions of years ago the first flowers came into existence and also the first bees. Since that time these two developments of nature have worked up an inter-dependence, so that the modifications of flowers as we know them have been developed through the agency of bees. In a corresponding way the bees have become modified in their body parts, as an adaptation to floral structure.

Flowers develop showy petals to attract the bees. Nectar is produced at the bottom of the floral parts to force the bees to dip down as far as possible in securing it. Pollen is produced in over-abundance as a delicious food for the bees. Bees in their turn have developed a long tongue for lapping up the nectar, a crop for storing it for the flight home, a body covered with remarkable pronged hairs for collecting the pollen and adaptations on the legs, the pollen baskets, for scraping together and transporting the pollen load.

Pollenation

In the visits to flowers, bees come in contact with the pollen; the little grains covering their body are then rubbed on the sticky stigma, often as a result of a remarkable arrangement in the formation of the flower parts. After pollenation, the stickiness of the stigma dries up so that the flower is receptive only for a few days, usually at the beginning of the blossoming period. As a further result of pollenation, the nectar ceases to be produced and the petals drop quickly. The flower is no longer attractive to bees.

Some trees that have a tendency to overset fruit, requiring costly thinning in commercial orchard practice, might be rendered less prolific if bees are withheld, or if sprayed with some corrosive spray that would destroy the stigma surface. The only drawback to such a recommendation is that if carried out one would not be sure of a setting of fruit at all. Most fruit men would prefer to thin a superabundance of fruit than to run the risk of getting no setting.

At the beginning of the fruit blossom season an orchard should be humming with bees. In fact, by actual observation in normal orchards, the honeybee has been found to outnumber all other visitors of flowers a hundred to one. Other insects may be present, as for example, a few bumblebees, some wild bees, a few butterflies and several species of flies; but all of these combined would have but little effect in cross-pollenation if the honeybee were excluded. Where actual tests have been made where either branches or whole trees have been inclosed in netting so as to exclude bees, it has repeatedly been found that the fruit crop suffers. Many practical orchard men hire bees for the blossoming period, the usual price to beekeepers being $5 per colony.

Keeping a small apiary in the orchard will bring returns many times greater than the cost of the colonies. Every one has noticed how fruiting has been interfered with by bad weather at blossoming time. When bees are not flying, the trees hold out the inducement of their blossoms a longer time, but if cross-pollenation is not forthcoming a heavy June drop may be expected. This is an important factor in growing prunes, berries and other fruit, especially in western Washington.

In this mutual arrangement of give and take the fact must not be lost sight of that it is the fruit grower who profits most. The bees insure a crop of fruit. Due to their activity the crop is increased, perhaps by 10 per cent, perhaps doubled. In return, during the day or two that each flower is visited, they get some pollen and nectar, not enough to build up stores, but only enough to stimulate brood rearing.

THE LARGEST FAMILY OF BEEKEEPERS

We reproduce herewith photo of the family of Mr. and Mrs. P. Mohr, of Bettendorf, Iowa. There are fifteen in this family and they are a healthy looking lot. We are interested in knowing whether there is a larger family of beekeepers anywhere than that of Mr. Mohr. If any of our readers know of a larger family of beekeepers we will be glad to have a picture and some information concerning them. Mr. Mohr writes that all the members of his large family like honey, but that only one—Anthony—likes the bees.

A large family of beekeepers. P. Mohr and family, of Iowa.

IRREGULAR LAYING OF EGGS

The queens need to lay an immense number of eggs during the breeding season previous to the honey crop. In order that the laying be continuous, it is necessary that it should be regular, with as little skipping of cells as possible.

The photo which we give is good of larvæ in the cells. But the regularity of the laying, in this case, is far from satisfactory. Whether this queen was too old, or perhaps too young and not yet accustomed to regular actions, or whether she is, in fact, an inferior layer without method, it is quite probable that such a queen would fall very far short of the maximum laying of a good breeder.

THREE WEEKS OF BEE CONVENTIONS

By C. P. Dadant

Lynchburg, Va., is among the hills, at the south foot of the Blue Ridge Mountains. I reached it on Sunday morning, January 16, invited by my old friend, Draper, to his home, a short distance in the country.

This is the same Draper who caused the Root people to manufacture for sale what is called by them the "Jumbo" hive, which is simply a modification of the hive adopted by us, with frames of the same depth as the Quinby and the same length as the Langstroth frame. Draper, who is 4 or 5 years younger than I am, and has been a beekeeper since childhood, visited us as early as 1874, when he was only 18 years old. Our acquaintance was maintained and he thought we had a good method of beekeeping. So in the nineties he urged upon the Roots the adoption of our style of frames, for they had also recognized that the large hive was a progress. The "Jumbo" hive was also called the "Draper barn" for that reason. It is almost identical with the "Modified Dadant," having the narrow spacing of 1⅜, however, instead of the 1½ inches from center to center of frames, which we prefer. We have often given the reasons we have for this preference. And by the way, how many of our readers know that the preference of the manufacturers for the shallow frames was caused by the greater facility of obtaining narrow lumber ? "Stock boards" ten inches wide, were a standard size, and the Langstroth hives could be made of that lumber, while it took 13-inch lumber to make Quinby size hives. Had it not been for that difficulty, I do not hesitate in saying that the deeper frames would have been adopted long ago.

Draper was at the station, waiting for me, but we had not met for some 30 years and each of us was looking for the young man of 30 years ago. Tempus fugit! So we hesitated in recognizing each other.

The Draper home is on the apex of a hill, on a 15-acre triangular farm, with the railroad on one side and a creek forming the other two sides. It is in full view of the Blue Ridge and surely a healthy place, though rather difficult of access in winter. But we got there from the little station of Leftwich, in spite of 6 inches of snow, with the help of a very nice neighbor beekeeper whom he had invited for dinner, and who volunteered to carry my suit case, saying that he "reckoned he could tote it along" and did, with hearty good nature. I spent a very pleasant day with Mr. Draper, his wife who is still young looking, and his two daughters. He has what appears to me a splendid location for bees, on the sheltered side of the hill, with thousands of the tulip trees and sourwood, besides sumac and fall flowers, in close proximity. He has been there only one year and does not yet know just how the location will turn out. His home was originally at Alton, Ill.

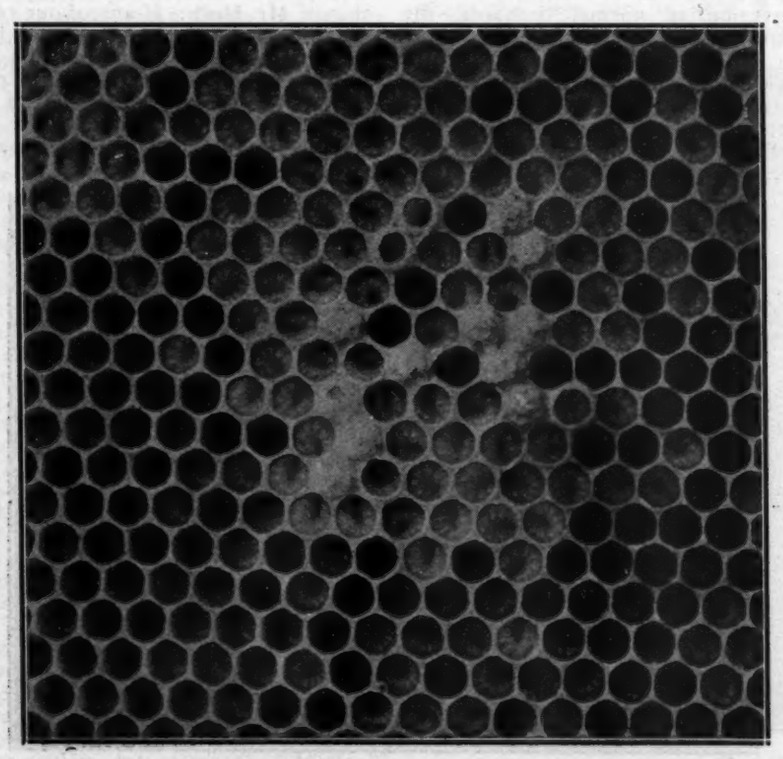
The following morning we went back to Lynchburg, for the bee meeting, which had been arranged with a great deal of zeal by Prof. W. J. Schoene, State Entomologist, who lives at Blacksburg, and Mr. Brandt, of Lawyers. Professor Schoene had cautiously warned me that we might find only half a dozen beekeepers at this meeting, for, he said, "the Virginia beekeepers are lukewarm." He was as pleasantly surprised as I was when we faced a crowd of some 35 or 40 honey producers, crowding the room of the Chamber of Commerce. They wanted to exchange thoughts and experiences. We had a splendid meeting, and I have since heard that they propose to stay together permanently.

Their honey plants are quite numerous: maple, willow, dandelion, tulip tree, sourwood, clover, both white and sweet, holly, laurel, basswood, etc. besides a lot of fall blossoms, such as goldenrod, asters, etc., which should put Virginia in the front rank of honey-producing States. There are still too many "gums" or box hives. I was told that in 1920 the bees secured pollen on the first of January. But this year they had more snow than any other place that I visited.

As I had an appointment for the next day, at Clemson College, S. C., I left that same evening for Calhoun, which is their railroad station. At 8:50 the next morning, I found another smiling face at the station, Prof. A. F. Conradi, Chief Entomologist. Clemson College is also in the shadow of the Blue Ridge Mountains, but close to the Georgia State line.

This college is an extensive institution, comprising some 20 or 30 buildings. There is no city near it, but it has adjoining it a village of some 300 people, with the usual country stores and a bank. Professor Conradi has with him Mr. E. S. Prevost, of the U. S. Extension in Beekeeping, a young and active man, who works in conjunction with their department; Mr. H. S. McConnell, a research worker in entomology; J. A. Berley, quarantine entomologist, and D. M. Anderson, extension entomologist. Much of their entomological work has to do with the boll-weevil that infests the cotton.

The meeting at Clemson College was attended mainly by students. But the following day, at Seneca, we had a meeting composed of a number of practical beekeepers, though some of them were box-hive beekeepers. Mr. Geo. Briggs, the County Agent, had called them together. One of the men present, R. L. Boggs, was a 35-year subscriber of the American Bee



Brood showing irregular laying of a queen.

Journal, and he and I felt as if we were old acquaintances.

That same evening Mr. Prevost and I went on to Anderson, where he lives and where I stayed over night in his home, after making the acquaintance of his wife, as nice a young woman as I ever met, and who welcomed me as if she had known me for years.

It had been very cold that day—that is, cold for South Carolina—and my fur cap, brought from Illinois, served very well, but was very much laughed about among our friends, though I thought they would have been glad to have such headgear themselves.

Anderson is a fine city, up to date in every respect, with water works, paved streets washed every morning, electric lights, trolley cars and interurban connections. It has a population of about 15,000. We had there one of the most interesting meetings, with some 50 people present. There, as elsewhere, the County Agent rounded up the beekeepers. We talked bees and cotton, for cotton is the staple crop, and is grown in terraces which follow the ridge of the hills to keep the land from washing. Those terraces, sometimes as many as 20 or 30 in a 20-acre field, have a very picturesque aspect. Grass and weeds grow on their edges and some bee pasture is in this way maintained among the plowed fields.

There does not appear to be much enthusiasm about the yield of honey secured from cotton, whether floral or extra floral, so I do not take it to be a very important source of honey production in that vicinity. Professor Conradi says their whitest honey is gathered from the sourwood.

Before leaving Anderson, I was taken to an immense cotton mill, running 1,500 looms and 70,000 spindles. Cotton mills abound everywhere and the next city in which we met, Greenville, was comparatively as smoky as Pittsburgh.

An instance of what might be called "local color" must be mentioned. On a cool morning, while taking a walk, I saw a darkey, driving a team, who had a fire to warm himself, in a pan, on some ashes, in his wagon.

On the 21st, after four South Carolina meetings, I took the train for Asheville, N. C., to visit with Mr. and Mrs. Elton Warner and take a couple of days' rest, before going to the last meeting of my trip, at Nashville.

A NEW CLOVER

I am sending a sample of clover about which I would like some information. There is a great deal of this clover in the meadows of the valley. Sometimes it seems to show a liking for soils that are alkaline. Otherwise it grows under the same conditions as does timothy. It makes a good grade of hay, growing from 12 to 18 inches in height. As a honey plant it seems to be almost unequaled in this locality—the honey being of lighter color than is either white sweet clover or alfalfa..

R. N. Sears.

Alturas, Calif.

The specimen is cow clover (**Trifolium involucratum.**) It is listed by Jepson in his flora of Middle Western California as "frequent along streams, by springs and in salt marshes." The plants have much the appearance of the alsike clover common in the east, except that the heads are more nearly the color of the well-known red clover.

Alturas is the county seat of Modoc County, the extreme north and east county of California. I can find no record of this species of clover anywhere outside of California, where it evidently is native, though no doubt it must occur in Southern Oregon also. There are more than 20 species of clover found in California. Probably all yield more or less nectar, although some, like the red clover, have corollas so deep that the bees cannot readily reach it.

From the appearance of the samples received, this cow clover has every characteristic of a valuable forage plant. Apparently it has never been brought to general attention and it may prove adapted to climatic conditions over a wide range of territory. Since it seems to thrive on alkaline soils it may prove valuable in many places where the better known varieties do not succeed well.

Perhaps if beekeepers living in that region would gather the seed and offer it for sale in small packets, it might serve to introduce it into other regions and increase the available nectar for beekeepers of other sections.—F. C. P.

NEWELL, DEAN OF AGRICULTURE

It gives us real pleasure to announce that Dr. Wilmon Newell has been selected as Dean of the Florida College of Agriculture, Director of the Experiment Station and Director of the Extension Service, to succeed Dean Rolfs, who recently resigned.

Newell is one of the leaders among American entomologists and has always been much interested in beekeeping. As Plant Commissioner he was successful in eradicating citrus canker from Florida, work which attracted wide attention.

The Florida institution has recently been giving serious attention to beekeeping, with a course at the college taught by Frank Stirling and a force of inspectors under Newell to eradicate bee diseases. With Newell in his new position, we feel certain that work in all lines of beekeeping will be advanced just as fast as funds available will permit and interest on the part of Florida beekeepers will justify.

NATURE OF THE BEE'S POISON

Formic acid has been popularly credited as the source of the poison in the sting of the bees. The following analysis, recently sent us by Mr. L. R. Watson, indicates that this common impression is in error:

Composition of Venom in a Bee Sting

By F. Fleury

1. Compound of the indole series.
2. Quinoline.
3. Glycerine.
4. Phosphoric acid.
5. Palmitic acid.
6. Unsaturated fatty acid of high molecular weight.
7. Volatile fatty acid, probably butyric.
8. A non-nitrogenous fraction.

Jour. de Pharm. et de Chimie (7) 22 December 1, 1920), p. 438.

FIRST ANNUAL MEETING OF AMERICAN HONEY PRODUCERS' LEAGUE

By H. B. Parks, Secretary

About thirty organizations were represented at the first annual meeting of the American Honey Producers' League.

The President, E. G. LeStourgeon, of San Antonio, Texas, called the meeting to order and H. B. Parks, Acting Secretary, reported on the activities of the League up to the present time.

B. F. Kindig, of East Lansing, Mich., Chairman of the Committee on Education, gave a very full report on the work done in Apiculture in the various State Schools. Dr. J. H. Merrill, of Manhattan, Kans., also a member of this committee, assisted Mr. Kindig in compiling this report.

The Bureau of Legislation, represented by C. P. Campbell, of Grand Rapids, Mich., gave an account of the activities of this Bureau in compiling and presenting a brief to the Chairman of the Ways and Means Committee of Congress, asking that a tariff of not less than 48c and not greater than 60c per gallon be placed on honey. Mr. Campbell stated that he had been assured by Hon. Rodney Fordney, the Chairman of the above committee, that there was but little doubt that this item would be placed in the regular tariff bill which will be voted upon early this summer. A number of minor activities of this bureau were reported, especially one in which there is a case between a beekeeper and a smelter company in Arizona. The League is planning, through its committees, to assist in the fighting of this case.

The most interesting occurrence of the meeting occurred the afternoon of February 15, when Clifford Muth, Chairman of the Special Advertising Committee, reported on their activities.

Mr. Wayne Calhoun, representing Proctor & Collier Advertising Agents, very briefly outlined an advertising program for the League, advising the papers in which the advertising matter would reach the greatest number of housewives, and exhibiting samples of the proposed advertisements.

The subject of the American Honey Producers' seal on each container of honey was discussed. It was the consensus of opinion that for

some time the League should not insist upon the honey being so labeled, but allow the buying public to become familiar with the League seal before the seal should be placed upon the honey containers.

However the secretary already has application for seals from a very large number of honey producers who are League members. Mr. Muth suggested that we pledge the money for the advertising campaign at once. This met with the approval of those present, and after many spirited speeches and considerable exhorting on the part of Mr. F. W. Muth, of Cincinnati, the following amounts were subscribed:

American Bee Journal	$ 300.00
C. H. Weber, of Cincinnati	500.00
G. B. Lewis Co., Watertown	400.00
Texas Honey Producers' Ass'n	700.00
F. W. Muth Co., Cincinnati	500.00
A. I. Root Co., Medina	1,000.00
Wesley Foster, Boulder, Colo.	150.00
Elyria Enameled Prod. Co., Chicago	200.00
Wisconsin Beekeepers' Ass'n.	200.00
J. J. Wilder, Waycross, Ga.	50.00
Georgia Beekeepers' Ass'n	100.00
Michigan Beekeepers' Ass'n	300.00
Utah State Beekeepers' Assn.	500.00
Indiana Beekeepers' Ass'n	100.00
Texas Beekeepers' Ass'n	100.00
C. H. Wiley, Harrisburg, Ill.	50.00

The Secretary and the Advertising Committee were instructed to obtain further subscriptions to the advertising fund, and it is very probable that between ten and twelve thousand dollars will be raised. The Executive Committee was instructed to place a contract for advertising which will consist of six one-quarter page ads in "Good Housekeeping," these ads to be backed up by articles on honey in the body of the magazine; also articles in farm and county papers published by three of the newspaper syndicates. In addition to this a recipe booklet is to be prepared for general distribution in answer to advertisement.

The officers were re-elected for 1921 and it was announced that the payment of dues made during 1920 would be applied on the present year.

The problem of raising additional funds for advertising was thoroughly discussed and Mr. A. L. Boyden suggested that we ask for two per cent of the value of last year's honey crop and Mr. H. F. Wilson, of Wisconsin, suggested five cents per colony. It was agreed that those soliciting for advertising ask that the beekeepers tax themselves either one or the other.

H. B. Parks was selected as Secretary-Treasurer of the League for the ensuing year and was required to give a bond in the sum of $10,000. The Committee instructed the Secretary to solicit contributions to the general expense fund of the League and to issue another number of the League Bulletin as soon as practicable.

The following associations have already voted to become members of the League:

Michigan Beekeepers' Association.
Montana Beekeepers' Association.
New York Association of Beekeepers' Associations.
Indiana Beekeepers' Association.
Tennessee Beekeepers' Association.
Wisconsin Beekeepers' Association.
Illinois Beekeepers' Association.
Kansas Beekeepers' Association.
Kentucky Beekeepers' Association.
Iowa Beekeepers' Association.
Nebraska Beekeepers' Association.
Chicago Northwestern Beekeepers' Association.
Texas Honey Producers' Association.
Texas Beekeepers' Association.
California Honey Producers' Association.
Utah Beekeepers' Association.
Colorado Beekeepers' Association.

MORE SEEDS FOR TRIAL

Through the kindness of our correspondent in China, Mr. C. G. Golding, we have received another lot of seeds which we propose to send to our readers for free trial. The seeds which we offer now are Sesamum. Sesamum is widely grown in Asia for the oil which is secured from the seeds. Sesamum oil is one of the best vegetable oils available for table use. It is said to be free from any unpleasant taste and to congeal far less readily than olive oil. It is cultivated as far north as latitude 42 in Japan, and is said to succeed well in the milder regions of Victoria, Australia. It should be adapted to a large portion of America. The seeds are said to be very rich in oil, yielding from 45 to 50 per cent. Nearly a million acres of sesamum are grown in the Madras Presidency, India, with large areas in China, Japan, Africa, etc. It is also extensively grown in Turkey. It is reported to be a good bee plant.

We have also received from Daniel E. Robbins, of Payson, Ill., a limited amount of the annual sweet clover which has been attracting so much attention of late. We will send samples of this also as long as the supply lasts.

Persons interested should send stamp to cover postage, and write address plainly.

SUPERS IN WINTER

By M. H. Mendleson

I notice that one of your subscribers in a late issue asks about leaving supers on in California. In my locations, where bees are sheltered from the winter and have the whole day sunshine, I leave my supers on with good results; but I leave the hive and supers full of honey for the winter, and they go through in good condition. I have always made a practice of leaving my colonies rich in stores for the winter, and that is one of the main requisites to give good wintering and successful production. So many extract so close at the close of the honey season that the bees have no chance to breed up strong with plenty of young bees to winter. Supers on with abundance of honey has always been a great advantage to me. California is the worst for moth, and bees can take better care of comb than the apiarist. For extra surplus combs a good fumigating house is a great convenience. Use carbon bisulphide. It is the most penetrating of any that I have used.

I contract my hive entrances from one to about three inches in length, according to strength of colony. I leave the opening in front of the cluster as a protection from robbers, should any weaken in strength.

California.

THAT EARLY BLOOMING SWEET CLOVER

Great interest has been manifested in the new early blooming variety of sweet clover. The American Bee Journal has distributed many hundreds of free samples to all parts of America and some to foreign countries. Blooming as it does, ahead of the ordinary white sweet clover, we believe that it will prove to be a distinct addition to the honey resources of the country. The following article is copied from the Grundy County, Illinois, "Farm Bureau News":

"Grundy County sweet clover is a white blossom, biennial clover that grows to a height of three and one-half to four feet and matures an abundance of seed that ripens three weeks ahead of the common white blossom sweet clover.

Several outstanding advantages credited to this clover by those who have grown it, are: 1st. It grows to a good height for harvesting, but does not require clipping, thereby eliminating the hazard of killing. 2nd. It ripens early, ahead of weeds, and is ready to thresh and hull before small grain. 3rd. It is a heavy seed producer. 4th. It has superior soil building qualities. 5th. It is unusually hardy to withstand dry summers and hard winters.

This new sweet clover has been present in Grundy County, Illinois, for five years. Not having heard of it elsewhere, we have named it Grundy County sweet clover. The first year its varying habits were not noticed. The second year, when it blossomed and seeded, its unusual habits of shorter growth, earlier ripening and heavy seeding were observed but it was thought this might be due to local influences. When succeeding crops came on the variations from the common sweet clover became more evident, and since then a closer observation and more detailed comparison has followed.

There is a difference of nearly three feet, on an average, between the common, tall growing sweet clover and the Grundy County sweet clover. The Grundy County sweet clover was ripe for seed harvest July 15 this year, and the common sweet clover August 5, making a difference of just three weeks.

This new sweet clover branches thickly about a foot above the ground and is a heavy seed-producing plant, ripening seed quite uniformly. Seed was harvested on eight different farms in the county this year with

yields varying from 5 to 14 bushels per acre. The early ripening habit of this crop makes possible the se d harvest before weed seeds and other seeds are mature.

There are several botanical differences between this and the common sweet clover in the color of leaf, shape of leaf, size of plant and size of seed. These were very noticeable when comparisons were made this year of the two clovers on the same farm, and same type of soil in different instances, and when the two clovers were on adjoining plots in one field.

The smaller size of the Grundy County sweet clover seed makes it practicable to sow less seed per acre. Tests made in the county this year indicate that 8 pounds of seed is sufficient.

The heavy residue in the form of 12 to 15-inch stubble, in addition to a large fleshy root, makes the crop valuable in its humus and nitrogen reinforcements of the soil.

The characteristics of Grundy County sweet clover make it adaptable to a wide usage and a crop that is practicable to grow for cash and soil building."

WAX PRODUCT

By Harry Lathrop

I believe Dadants once published the statement that the wax produced in their various apiaries in a certain season was sufficient to pay for the labor of extracting the honey. This will serve to call attention to the importance of wax as constituting a part of the profits of beekeeping.

The writer has prepared quite a lot of wax for market by the use of the Hatch-Gemmel press, but I never could succeed in getting real bright, clean wax, and concluded there was some defect in my method. There are a great many handicaps in working with a small outfit. I have concluded that I will never use the press again.

For a small apiary this is my present plan: Take a strong, clean sugar barrel with the head out, dump into it well-drained cappings, bits of comb, old combs to be discarded, breaking them out of the frames preferably in cold, frosty weather. Have a tamper and keep pounding down the comb and bits of wax as you proceed to fill the barrel. You will be surprised to find how heavy this barrel will be when full to the top. I have just finished one that weighed 160 pounds net. It consists of about a bushel of cappings, the balance old comb of all descriptions, some badly moth eaten. When the barrel is full, head it up securely and ship to some factory to be rendered. Do this in the dead of winter and obviate all danger of spreading disease, as no bees are out foraging in cold weather. For larger apiaries I would have a good sized melting tank. I would heat up my cappings and scrap by a slow, steady heat. When ready I would dip clear wax out of the tank into heated molds such as a flaring tin bucket with about four inches of hot water in the bottom. In this way one would get a lot of nice wax at once without pressing. The balance contained in the tank after cooling and draining, would be tamped down in the barrel and shipped as before stated. This operation would be best performed in warm weather, and no spread of disease should occur from such practice. I consider the movement of manufacturers to do this work one of the best things that have happened for beekeepers of late.

Any ordinary beekeeper trying to save all his wax by the use of small and inadequate equipment has a job on his hands, and a dirty one. From now on such efforts will not pay.

Wisconsin.

GEMS FROM THE PAST

Selected by C. W. Aeppler

Beekeeping is not an occupation in which one can easily become wealthy. It can be depended on to furnish a comfortable living, and perhaps enable a man to lay up a few thousand. Fortunately, however, the professional man's happiness bears little relation to the size of his fortune; and the man with the hum of the bees over his head finds happiness deeper and sweeter than ever comes to the merchant prince with his cares and his thousands.

—W. Z. Hutchinson.

Do not think you are rich when you have hived a lot of young swarms. Fewer hives with lots of bees in each one is better. —Hase (1771).

In order to be a beekeeper, one must use his head.

—J. L. Christ (1783).

A bee that has learned to rob will find it difficult to return to an honest living. —Langstroth.

Every insect provides a world of wonder; but in the case of bees, two worlds must have come together.

—Bonnet.

The more help a colony of bees requires in the spring, the more evi dence is manifested that the owner is a poor beekeeper.

—Ziwansky.

BEEKEEPERS BY THE WAY

Mendleson talking bees to a group of California beemen.

A Successful Californian

For 50 years a beekeeper and for 40 years a Californian, M. H. Mendleson, of Ventura, is one of the best-known commercial honey producers in all America. He has owned as high as 2,000 colonies of bees at one time and has produced more than 100 tons of honey in a single year. For 30 years he has practiced migratory beekeeping, so there are few men who have had such wide experience as he. He was one of the first to discover the fact that to winter the bees with a big reserve supply of honey is the best insurance of a good crop the following year. Mendleson says he can get his bees through with 25 pounds of stores per colony but that he counts on leaving at least double that in each hive, and that it often pays to leave even more.

Mendelson was first attracted to California by the shipment of ten cars of comb honey to the New York market by the late J. S. Harbison. That was in 1878. At that time Mendleson was a young man keeping bees in New York. After seeing the Harbison shipment he decided that California was the place for him and we soon find him working for R. Wilkin at Sespe, where he remained for two years before starting out again for himself.

Because he has had such wide experience in every phase of honey production and has been so constantly successful, he is a popular speaker at conventions. The picture shows him talking bees at an outdoor meeting.

FITTING THE ALEXANDER FEEDER

By John Protheroe

I have always been a firm believer in the advantages of the Alexander feeder. To me the bottle entrance feeder is an abomination. It has many objectionable characteristics. It is the cause of nine-tenths of the outbreaks of fighting in queen yards, where feeders of one sort or another have to be almost constantly employed. It is incurably messy; the best that one can do with it is to dip it in a bucket of water after filling, dry carefully, and wipe around the neck with a kerosened rag—a lengthy and tiresome operation. Theoretically, the wooden holder should always be dry and clean; practically, owing to some of the holes being a fraction too large, they manage to get into a puddly condition. The "shiny professionals" know all about it; wherever there is a leak or a messy bottle, there do they congregate, furtive, hairless, sneaking, parasitic rascals; starting up trouble and demoralizing respectable bees. The best that one can say for the bottle feeder is that with a large three-pint bottle and holes of exactly the right size you can get a continuous flow of small volume, instead of small regular doses given in the Alexander. In the case of hot sunshine the bottle is also liable to develop fermentation. Nectar naturally comes in doses, and not in a steady flow all night, so that the process is not copying nature. Nectar naturally comes with a rush in the morning and then gradually tapers off to nothing. If you wish to copy nature, that is how you should feed. So don't produce the "nature" argument against the Alexander. When preaching the advantages of the Alexander feeder, I have usually been met with the objection, "It is so unsatisfactory to fit. You cannot get the hive to rest evenly over the feeder." Now, that is just exactly what you can do; that is the strong point of the Alexander. It is possible to use it year in, year out, without spilling a drop. It is the cleanest and most easily refilled of all feeders, and undoubtedly the warmest for feeding in the cold weather of early spring. It can be used for rapid feeding in the fall, a purpose for which the bottle feeder is most inefficient. It can be used for getting reserve combs filled with syrup and sealed during slack times—a dangerous process for which you require an isolated, bee-tight feeder and no open covers. The large Canadian tank feeder is serviceable only for rapid work in the fall; further, it entails removing the hive cover, as does also the Doolittle feeder (with its soup of drowned bees). Taking it all round, there is no feeder like the Alexander. It lies snugly under the brood-nest, far from temptation to entrance robbers. When properly applied, it is absolutely clean and bee-tight.

The advantages of having hive-stand, floor-board, alighting-board, and feeder combined are obvious, so I make no apology for pointing out the merits of my design. European hives nearly all incorporate hive-stand, floor-board, and alighting-board in one piece. Americans have hitherto insisted on portability, and on the reversible feature of the floor-board—to my mind unnecessary—seven-eighths inch, with contracting device is perfectly good enough. And is it not a fact that manufacturers have paid too exclusive an attention to the needs of the cellar wintering community, to the disadvantage of those to whom portability is not as necessary as other features? The spread of large-scale beekeeping through the southeast makes it curious that the pattern supplied by dealers is still that designed for the cellars of the North.

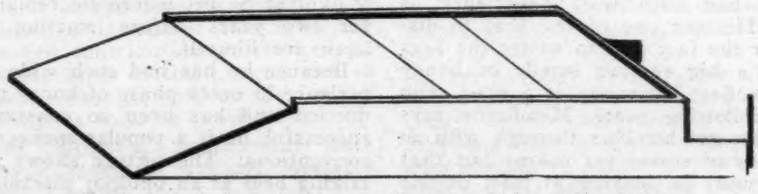
The combined hive-stand and alighting-board supplied at present as an extra is a poor sort of compromise. It certainly does not go with the reversible feature; it cannot fit both sides. It is not a close fitting, and it is liable to be jolted out of place; there is an objectionable gap just at the hive entrance. In my design you lose the three-eighths inch feature; but for the trivial sacrifice you gain the advantage of having permanent hive-stand with alighting-board, floor-board, and the most efficient feeder concentrated into one close-fitting hive part.

The design speaks for itself. The floor slides into grooves cut in the sides (as in the present reversible pattern). The feeder is held on the back projection either by a couple of upright metal strips nailed to the ends of the side pieces or by a board across. The board has one advantage in that when drawing the hive back over the feeder less accuracy is necessary.

There is an alternative to the design I enclose. In this the feeder is thrust through holes in the sides of the stand just large enough to admit it, the top of the feeder being flush with the surface of the floor and forming part of it. There are objections to this which make preferable the design that allows the hive to be slid back and forth over the feeder at will.

Virginia.

(While the Alexander feeder will do very well for stimulative feeding where queen rearing operations are under way, as described by our correspondent, a friction top pail with a few holes punched in the top, turned upside down in the super is far better for ordinary purposes.—Ed.)



Prother's method of attaching the Alexander feeder to hive bottom.

HEARTSEASE

Would Mr. Pellett care to describe why "heartsease" is known otherwise as smartweed, while "hearts-ease" is a violet or pansy?

It seems to me that there is more than a hyphenated difference between smartweeds and pansies, at least when considered from a honey-yielding standpoint. The poetical version of the word makes it a good name for a farm and I have been considering it for such, but first I want to know which is the more generally accepted meaning of the term; whether it would signify peace and tranquillity or merely a place overrun by a certain rather noxious weed.

Illinois.

Heartsease indicates peace and tranquillity, but just why the common smartweed or lady's thumb should be called by that name I could never quite understand. There is no accounting for common names. Some common plants are known by a dozen different names, while the same name is applied to as many different plants in different localities.

The pansy (**Viola tricolor**) has long been known as heartsease, or preferably heart's ease, written in two words. As far as the hyphen is concerned, there seems to be no regularity in its use. The name is written as one word and as two words as above, and also with a hyphen, as applied to either plant.

In addition to the pansy, the name is applied to the wallflower. In Australia it is used in connection with still another group of plants, the **Gratiola.**

Among beekeepers "heartsease" means the lady's thumb, or smartweed **Polygonum persicaria.** Weed though it be, it yields an abundant supply of fair quality honey. A good crop of honey tends to the peace and tranquillity of the beekeeper. In any case, it would seem that "heartsease" would be a very appropriate name for a farm home, especially if it be occupied by a beekeeper.—F. C. P.

KEEPING COLONY RECORDS

A subscriber asks for information regarding the system of records kept by M. H. Mendleson, who is one of the most extensive producers of honey on the Pacific Coast. This query was submitted to Mr. Mendleson, who replies as follows:

"My records are kept something like the following:

Date of examination, health first; No. of colony, queen, age of, amount of brood if any, strength; amount of honey; a colony for swarms, etc. If I run for comb honey we cannot prevent swarming, and my locations are great for swarming, as a wet winter is followed with a long spell of stimulation before the honey flow commences. I have a column for record of date of swarms and to what terrace and number the swarm is located in the apiary. By so doing I know

where to locate any particular colony or queen.

I have a separate book to keep a record of scale hive, which is an average colony; thermometer, barometer, and conditions of weather, etc.

The moving of bees, of late years, plays havoc with individual records, as thieves cause me such great losses that I have to move my bees away to the coast, where I can catch them. This is done after the sage flow is over; so then I take advantage of the bean flow, which commences about July 1 to 10, following wet winters.

As you are well aware, I am the pioneer in moving bees to the lima bean fields, as one favorable season I extracted 140 pounds of surplus per colony from the beans. This was an exceptionally favorable location. Many of the farmers are prejudiced against bees; so this favorable location was sold and I could not secure it again. There are other locations where I secured two good extractings, about 100 pounds per colony.

To return to records. If a person permanently locates his colonies of bees, a good system of records is a saving of time and a great satisfaction to the owner. Any particular colony in an apiary that needs attention, you don't have to hunt to find it. Your record will direct you to the number, and you will know the exact attention needed.

I have had as high as 900 colonies in one apiary, and in such a large apiary a record is a great convenience.

My Piru location used to be able to support (following a wet winter) 1,000 colonies, but many mountain fires during a series of dry years have killed out a great area of the sages, so that it will not support ov r 500 to 700 colonies now, or following a wet winter.

California.

A VENTILATED HONEY HOUSE

In the Sunny South, where there are many warm days when it is necessary to work among the bees, we sometimes find honey houses partially screened to give free access to every breeze that blows. In our November, 1918, issue we pictured a honey house in West Texas which had an open strip clear around the building which was covered with wire cloth to keep out the bees, while freely admitting the air.

The picture shown herewith of a honey house on the plantation of W. W. Worthington, of Wayside, Miss., shows the ends covered with wire cloth, while the rest of the building is closed in the regulation way. These ventilated buildings are used for extracting, mostly.

THE CORNELL SHORT COURSE

By Gove Hambridge

A large group of the beekeepers of New York State spent an instructive and enjoyable week at Cornell University February 7 to 12, in attendance at a short course for commercial beekeepers held under the auspices of the New York State Agricultural College. The week was crowded with lectures from 8 a. m. until bed time, and the writer of this does not remember getting quite so solid a block of information in any other single week of his life.

There were two types of lectures—those by experts in apiculture and those by experts in other branches of agriculture closely related to beekeeping, the latter being something of a new departure in courses of this sort. Dr. E. F. Phillips was the principal speaker. Beginning with "The Fall Period," he considered in successive talks "The Behavior of Bees in Winter," "Outside Wintering," "Cellar Wintering," "Symptoms of the Brood Diseases," "Spring Management," "Variations in Locality," "The Treatment of American and European Foulbrood," and "Variations in the Virulence of European Foulbrood." His talks were crowded with valuable fundamental data regarding the exact qualities of nourishment by weight that bees require at the various stages of their development, calories of heat in larval growth, and similar scientific underpinnings for sound practice. Most novel, perhaps, was his careful analysis of all the chief honey regions in the United States, with the effects of soil, temperature, rainfall, and elevation, on nectar secretion; and the results of his original investigations into the regional variations in the virulence of European foulbrood, in which he showed the effects of soil conditions as factors strongly affecting the disease.

G. S. Demuth was able to be present on one day only, during which he crowded in two rapid-fire talks on "The Honey Flow and Control," which kept pencils dancing across note books. George H. Rea admirably supplemented the discussions of Dr. Phillips with lectures on certain practical aspects of beekeeping: "Little Known Honey Sources of the State," "Requeening," "Wintering in New York," "Prevalence of Bee Diseases in New York," "Preparation for the Clover and Buckwheat Flows." His intimate knowledge of almost every corner of the State enabled him to correlate the practices of widely scattered beekeepers and present principles applicable to various regions.

Not the least interesting talks were those by experts outside the apicultural field. All of these talks centered on beekeeping and were valuable to the beekeeper, giving him accurate and authoritative information which he would not ordinarily obtain save by painful research. Professor G. H. Collingwood, for example, talked on trees, as sources of nectar, as windbreaks, etc.; Professor Robert Matheson on "Sources of Honeydew" (a very complete expose); Professor G. W. Herrick on "The Value of Bees in Pollenation"; Professor E. L. Worthen on "Soils and Their Treatment," especially as affecting nectar secretion; and Professor K. M. Weigand on "The Mechanism of Pollenation and Nectar in Plants." A. Gordon Dye, besides presiding at some of the sessions, gave a graphic account of the development and construction of his winter packing case, illustrating his talk with a complete little model.

Dr. J. G. Needham, as chairman, endeared himself to everyone by his inexhaustible humor and consummate skill in introductions. He also gave a talk on "The Society of Bees and Men," and there were other very enjoyable evening addresses by members of the Cornell faculty, including President A. W. Smith, Dean A. R. Mann of the College of Agriculture, and Professor A. A. Allen, the ornithologist. Professor G. W. Whitney, of Cornell, decidedly aided the spirit of solidarity by conducting group songs.

Four features stand out in the mind of the writer: the wide range of scientific data presented by Dr. Phillips; the valuable side lights given by authorities in related lines of activity; the indefatigable efforts of George H. Rea, resulting in a week that ran as smoothly as clockwork, and the cordiality of the University's spirit of co-operation toward the State beekeepers. To this must be added the fine spirit of mutual helpfulness and friendliness evidenced among those who attended.

The Worthington honey house is screened at both ends to provide a comfortable work room in hot weather

INCREASING CONSUMPTION

By E. S. Miller

Those who attend bee conventions or who read the journals seem to be divided into two camps. There are the beekeepers whose desire is partly for entertainment and partly to learn of any new stunts in handling bees. On the other hand, there are the honey producers who are in the game for business purposes, and whose chief interest lies in marketing the crop. It must be conceded that the beekeepers are in the majority, but it is the producers who deliver the goods. However, there is no law to prevent a fellow from belonging to both parties. No good reason appears why a beekeeper should not be a business man as well.

For many years the pages of our bee journals have been devoted almost entirely to increased production of honey. The efforts of supply manufacturers and dealers and of government officials have been toward the same end until now, under prevailing conditions, the supply exceeds the demand. The present need is for increased consumption, to be brought about by more extensive and more judicious advertising and by better distribution. In my opinion this can be done most effectively by organizations of the producers themselves. For advertising and for general direction in the process of distribution, the American Honey Producers' League promises to be the most effective agency. I do not believe that it is wise or practicable for this organization to undertake the sale of honey, but it should encourage and assist the producers' selling agencies that are being established in various parts of the country. Such organizations will tend to eliminate some of the unnecessary costs between producer and consumer.

At the present time the honey bottler seems to be having his innings. But bottling is an expensive process and nearly doubles the cost to the consumer. It must be conceded that honey put up in glass is more attractive, but people do not buy it in this form for food, as a rule. They take it in homeopathic doses as a "medicine." Of course, the consumer "demands" the small package. He (or rather she) would buy it in thimblefuls if possible, but the final result is a much smaller consumption of honey. I believe that our advertising should call attention to the economy of purchasing in larger packages. If the consuming public can be induced to buy honey granulated hard in 5-pound and 10-pound pails it is by all odds the most practical and least expensive way of handling it.

Indiana.

BEES AND FRUIT

The accompanying photographs were taken at the apiary of J. W. Snodderly, near Omaha.

Mr. Snodderly, some years ago, purchased 30 acres of hilly and bottom land near the Missouri River, with the idea of raising small fruit and truck. The Missouri, as it sometimes has the habit of doing, changed its course somewhat and took away a good portion of the farm. A succession of dry seasons helped to put Mr. Snodderly in bad financial circumstances. In the spring of 1918 he was induced by a sister to turn his attention to bees. At that time he had 14 colonies in boxes of various kinds. He joined the County Honey Producers' Association and began in earnest the study of the bee business.

In the spring of 1920 the apiary consisted of 27 strong colonies in modern hives. He increased to 46 colonies and produced 3,000 pounds of honey during the year.

BEEKEEPERS AND ENTOMOLOGY

By Henry W. Sanders

In the February number of the American Bee Journal is the answer to a question as to whether beekeepers ought to study the vast and intricate science of entomology, and while the editor covered the matter very fully, there is one aspect of the case that has great practical importance, yet is seldom mentioned in the journals. The only textbook that we know of that deals adequately with the matter in question is Phillips "Beekeeping."

The matter referred to is the frequent comparisons that are drawn between the life and behavior of bees, and of human beings. This is exceptionally frequent in English books on the subject, but our American ones are by no means free from it. It is something that easily provokes wonder and amazement to point to the works and actions of a hive of bees with the idea in one's mind that they "think" just like we do, but even a cursory study of entomology will reveal the absurdity of such comparisons. Therefore, if it is asked whether beekeepers should study entomology, the reply should be given that studies of other individual orders, species or varieties of insects (however interesting) will not aid them as beekeepers, but that an understanding of the structure and general place in the creation of insects **as a group** will give them the key to much that is astonishing in their behavior, and will aid in the avoiding of incorrect ideas, for these latter always breed bad practices sooner or later, and the art of keeping bees is only suc essful as long as it follows closely to the natural laws that govern the life history and habits of the honeybee.

Mr. Snodderly's advertising sign for attracting customers from passing tourists.

Maeterlink has dealt with the business from the philosophic standpoint, and tries hard to establish a common ground of consciousness between man and bee. How far he succeeds it is not for me to say. The point I do wish to emphasize is that humanity and bees present such a series of flat contradictions, such a contrast in modes of structure and life that we are physically unable to meet on the same plane of thought or motive. Let us look at a few of the main contrasts.

In structure we have our skeleton inside and a fleshly covering—the bee carries her skeleton outside. We are centralized with the brain in the head and our nerves centering there. The bee has her nerves scattered all over the body, uniting in "local brains" (ganglia), where the nerves meet. The fact that the ganglia at the head of the insect are rather larger is merely due to the presence at that point of the sense organs of eyes and antennae. The eyes of the bee are compound, and non-adjustable, one fact which alone might explain a vast difference in comparison with a being whose organs of vision are instantly focused as ours are.

Turning from structure to development, we find that the insect life is divided generally into three distinct periods, corresponding with the changes in metamorphosis. In the first, all the eating is done; in the second all the sleeping, and in the third all the breeding; this in contrast with our development, wherein we begin as perfect, though small, individuals, and grow larger, interspersing our eating, sleeping and breeding, throughout life. The bee is an anomoly through its communal development, but essentially the last or perfect stage of its life is really the breeding stage of the insect, greatly elaborated and complicated.

When we cut our finger it heals. The hand of the workman wears perpetually away, and as steadily is replaced from beneath. Our bodies contain myriads of cells that are at work repairing and replacing tissue all the time. The result is that until an injury or disease actually stops our essential organs, we live. An insect, however, wears out like a garment,

and has no such renewal. There is something infinitely tragic and incomprehensible in the wondrous garments and beauty of many insects, who wear their splendors for but a day, and having bred, and laid their eggs, die.

In the honeybee we have a form of life which, with the ants and a very few allied species, takes the same relationship to the lower orders that man does to the warm-blooded, vertebrate animals. They display a highly complex organization, and a great elaboration of the simpler forms and processes of life. Within hist rical times they have not changed i. the least, and their actions can be calculated with certainty if we know the surroundings and impulse that are acting upon them. The art of beekeeping, as expressed in the production of honey is strictly empirical, that is, it has resulted from the observing of these actions and stimuli, and the devising of apparatus, etc., to meet them. We do not, however, understand in the least the underlying mysteries, and we in all probability never shall.

Manitoba.

QUEEN INTRODUCTION

By C. E. Fowler

On page 57, January American Bee Journal, Allen Latham gives us a very good article on "100 Per Cent Introduction," but he doesn't say whether he means 100 per cent of queens in a week or a month or 100 per cent of the amount of time required or the financial advantage of the different methods of introduction. He hints at the advantages and disadvantages of different methods.

A few years ago I introduced 12 queens in 12 swarms of about 4 pounds of bees in each by the regular cage method without losing a queen; 100 per cent, but in a month's time five queens were superseded, leaving 58 1-3 per cent. Why they were superseded, I am like Dr. Miller, "I don't know," but I can guess. When a queen is laying 2,000 eggs a day and is mailed a thousand miles in a cage where she can't lay an egg and is put in the hive in the cage for a few days and can't lay any eggs, and the bees release her and think she looks nice and are well satisfied; but she cannot lay a regular supply of eggs for several more days, why should they not begin to worry and start a queen-cell and take a notion to destroy the queen? So I have studied up a new way of introducing queens which I think not only saves most of that 41 2-3 per cent but gives the queen about 4 days extra laying, which would equal one or two pounds of bees and some seasons of the year may be worth dollars.

I make two wire cloth frames and put one on each side of a frame of hatching brood, take the perforated tin off the cage and put it on one side of the brood on the side where the most bees are trying to get out.

In 24 hours there may be 1,000 bees hatched out and the queen has 1,000 places to lay, and if you let her out by taking the wire frames off she not only has 1,000 friends (more or less), but she has her laying machine in working order, and I think 100 per cent of your queens are safe from supersedure, but not safe from accident.

If a greenhorn looks in the hive every day and occasionally (if smoked at the entrance) the queen is on the lid and he puts it on the ground leaning against something, and then hunts for the queen in the hive and can't find her, and while he is looking for the queen she crawls off the cover and he leaves her in the grass, the 100 per cent is broken.

Allan Latham says a breeding queen should never be subjected to any other method than that of letting her loose upon combs of hatching brood, kept warm by artificial heat.

I tried that method once on a select untested queen and left the entrance open and never saw the queen again. 100 per cent—100 per cent. The queen would not be in a natural position, with nothing but hatching brood (I will say emerging brood) and artificial heat, especially if the heating apparatus was made by some amateur.

I am surprised that Latham should put the cages on the top of the frames. I always put them between frames in the middle, so the bees will keep them warm and get acquainted more easily. The frames I spread far enough so the bees can get on the wire of the cage and the cage resting on two nails pushed in the comb.

I made my frames of wire netting, 8 to the inch, and the bees can feed through and get acquainted more easily.

Some mosquito netting is 14 to the inch, and should not be used.

A friend of mine had foulbrood and I was helping him, and he killed the old queen against a small pear tree, and the swarm clustered on the tree, where the odor of the queen was located.

We scrubbed the tree with soap and water. The bees clustered again. We brushed them off and dumped them in the hive. Then we put carbolic acid on the tree, but they would cluster. He cut the tree down, then the bees tried to get into the wrong hive and got killed by the quart.

The next time I introduced queens I tried this way: I caught the old queen and killed her against the new queen cage, but never saw much advantage, and I hated to do it.

Now when I kill the old queen I make a hole in the ground with my toes and bury her so the bees cannot find the odor, as I have seen the bees find a new queen (in cage) in a shed and a hundred bees covered it in a few minutes. I don't know why they did it, but I had to hide the queen cages.

I have nothing against Latham, for I have used his queens and think they are very fine.

While talking about queens I want to ask Latham a question.

I bought some queens last year. I am not sure, but I think they were Latham's. It was 4 or 5 days before I put them in, and in one cage every bee was dead but the queen, and in another cage every bee was alive but the queen, and I noticed the queen was curled up, but I did not know why, so I put the live queen in with the live bees, and before I knew it one bee stung the queen to death and the queen curled up same as the other one.

Why did the bees sting the first one? Why the second one? It was perhaps my fault, for not introducing as soon as I got them. I only lost $3. Some queens are worth $10 for the extra amount of honey their bees store in one year.

New Jersey.

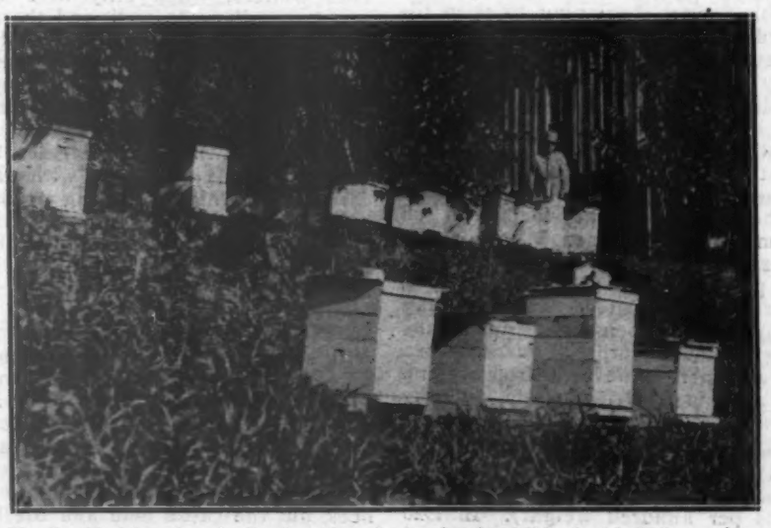
LAVENDER

By Ph. J. Baldensperger

In your recent numbers you reproduced various articles on lavender. Here is what we have in the Alps:

1. **Lavendula Stoechas** (Linn). The bushes carrying this lavender grow all along the lowlands in porphyraceous soil, and going up the rocky hills to a hundred metres (330 feet) above the level of the sea, from Menton to Toulon, in the pine forests of the Esterel and Maures regions.

The bushes grow densely and are



Mr. Snodderly's apiary in Omaha, where beekeeping is combined with fruit growing.

sometimes a half meter (20 inches) or thereabouts, in height. The leaves are grayish or almost shriveling—or **frisees.** The dark purple flowers are in a dense ear or spike containing a dozen or more. The top of the spike is furnished with long bracts, same color as the flowers, or sometimes violet. I counted over 30 such spikes on a single plant. They flower from March to May and are visited by bees, though not to compare with the other kind. Their odor is very agreeable.

2. **Lavendula latifolia Spica.** This kind grows higher up—from two to four hundred meters (600 to 1320 feet) above the sea level, in calcareous soil —equally along the maritime line—some distance inland, except where the mountains fall directly into the sea, as about Monte Carlo or Beaulieu. The bushes are few and far between. The bush proper is very low, but the spikes grow up to nearly 75 centimeters (2½ feet) and with alternate and long, lanceolate, grayish leaves, sometimes more than 5 centimeters long (2 inches). The flowers grow in thin spikes, though elongated at the top of the stems, bluish in color. They flower about June and sometimes till the end of July. Bees visit them when other flowers are scarce.

The plants are sometimes mistaken for true lavender; but on nearer examination, and by the odor rather than by the flowers, they are recognized. They are also used for perfume, but only when the other kind is wanting.

3. **Lavendula officinalis, vers.** These are the queens of flower and perfume. The bushes are usually very densely covered with very odoriferous leaves, longer than in Stoechas but shorter than in Spica. As a rule, they grow only above 400 meters (1320 feet) above the sea level and up to 2,000 meters (6600 feet). They do not like the forests, as do the other two congeneres, but seem to be wholly independent and want the whole field for themselves. The bushes show any number of flower stems, growing up to half a meter, each stem crowned with a dense spike of bluish flowers, beginning to open towards the end of June. Though some plants may slip down till near the sea, they are never worth while for bee fodder. Whilst all the arid mountains are covered with millions of bushes, mostly growing wild, they give the most delicious honey of a yellowish amber or whitish color. The peasants gather them in donkey loads and sell them by the hundred kilos for the Grasse perfumes, or some enterprising peasant distils them, on the spot, near running water. This distilling is done in the open air, as during the long summer months, in our southern climate, there is never a drop of rain. An alembic (still) is set up, and the lavender is boiled then and there.

The prices vary very much. Before 1914 they were paid from 5 to 10 francs per hundred kilos (44 to 90 cents per hundred weight). In 1920 the peasants left everything to go for lavender, as some speculators paid them over a hundred francs per hundred kilos ($9 per cwt.). A good hand with a mule or a donkey to carry the bundles, can gather 150 kilos or over in a day. The mountain sides are so abrupt that not all can be reached—a good chance for the beekeepers—since they are cut in the honey season. Happily, there are, in some places, more flowers than hands to cut them and the bees are happy as well as the beekeeper.

In the Basses-Alpes, Vaucluse and other places, they are cultivated on a high scale for perfumery.

UINTAH BASIN BEES

By Frank L. Arnold

Transcontinental tourists who traveled this summer from Denver to Salt Lake by the Pike's Peak highway may have noted an unusual honey flow in the two Utah counties of Uintah and Duchesne, two counties that have always been famous for the abundance and quality of their honey. These two counties lie in what is known as the Uintah basin, and are made up of a former Indian reservation lying in the Duchesne valley and of the land in the Ashley and Green River valleys. Here bee conditions are among the best in the United States, and have two unique features in the bee world. The average flow of honey is certain every year and the beekeeper on a small scale is encouraged to entrust his colonies to experts and to share in the returns rather than to care for them himself.

The country rolls in sweet clover and alfalfa bloom. Mr. Dan H. Hillman, President of the Uintah County Bee Association, said in July that he could not work fast enough to give his bees room; that he often had to put on as many as five supers, and that the Uintah Basin honey flow never was a failure, though it was often less than this year. This, according to Mr. Hillman, is the cardinal excellence of the country as a bee pasture. It offsets the long, cold winters, when only bees wintered in cellars do well, and there is much loss from spring dwindling. He, himself, has spent three winters in California, looking for a better bee country, but has been unable to find it, though he studied the Imperial Valley, the Los Angeles and San Luis Obispo districts with great care. California, according to him, often has a greater honey flow than these two Utah counties, but it often has an entire failure, while Utah is a surer average country. Even in the poorest season, the Uintah basin has an average of 87 pounds per colony, with some colonies producing as high as 120 pounds. Most summers there are tons of nectar going to waste and you can see miles of sweet clover bloom by the roadside and ten-acre tracts without a bee on them.

Of course, nearly everyone keeps bees, but the cattle man and the hay rancher are naturally not so expert in the work as the professional beeman. So it has been the policy of the county agent, backed up by the farm bureau, to encourage the small inexpert beekeeper to take his bees to an experienced beeman, who will look after them carefully and return a certain share of the profits to the owner. Thus Mr. Hillman took last year a lot of 20 colonies, hived in candy buckets, soap boxes, coal oil cases and other makeshift hives. He put them into movable-frame hives, which the owner paid for, cared for them through the season and returned to the owner 30 pounds per colony, and, like a good cattle man, was ready to make the old stock good.

This, Mr. Hillman thinks, is a fair contract between the expert and the inexpert ,and in such contracts he sees a necessary condition to making the Uintah Basin a banner bee country. Some foulbrood has been brought in from Salt Lake City, and only experts can control it. In like manner only experts can handle a colony so that it will produce its limit, and it is an old principle that a cobbler should stick to his last. Some people were never meant to work with bees, and never can learn.

With regard to the marketing of honey,Uintah Basin has still much to learn. It is mostly sold in 5-gallon cans and, though the automobile tourist will eventually want as much as that, it looks big to him for a first taste. There are no posters along the highway exalting the excellence of Uintah's sweet clover honey, and many tourists who stop at the public camps are apt to pass through without knowing that they are in a honey country. If they stop at a hotel they are pretty sure to get the honey on their hot cakes. It would be excellent advertising for the commercial clubs to present every tourist with a small jar of the honey. It would make him a life-long booster for the honey.

France has her wine always on the table, Normandy drinks cider like water, and the United States would do well to adopt the Swiss custom of the breakfast honey pot. Utah honey could easily become more famous than Utah celery. At Moffatt, near Duchesne, one of the best ranchers, with bees as a side issue, is C. W. Bodily. He and his wife are making money from bees and turkeys, though their chief object in life is a 100-acre hay ranch. Mr. Bodily has worked with bees ever since he was a child and says that never in the history of the world has there been honey like that which the bees gather from the sweet clover around Fort Duchesne. And you'll say the same if you taste of it. It often brings 50 cents a pound in Denver, and customers cry for it. The bees work on the sweet clover in preference to alfalfa, and the honey is less sharp than alfalfa honey and sweetens as it ages. People that never care for other honey, like it.

From his 100 colonies on July 27, Mr. Bodily extracted 60 cans, that is 3,600 pounds, and that was just the beginning of his season's work. His wife helps him in the uncapping of the comb, but her chief success is with turkeys.

The State Farm Bureau helped last year in the sale of Uintah honey. The bee men had contracted to sell their honey to a local firm at the Denver market price, less the cost of freight. The contract was not lived up to, and the Uintah bee men were feeling rather sore, when the county agent began to sell it for them through the other county agents of the State. The first sold in Coalville at $3 less than the local price for 5-gallon cans. It sold everywhere in the State, from Grouse Creek to Kanab, at a better price than the Denver market price which had been offered, although in every case it was lower than the local price and came into competition with honey from other parts of the State. Some of the honey even traveled to Oklahoma and, though it cost the buyer there $17.50, he sent back for two more cans. "Beats anything in honey I have ever eaten," was his comment. An agricultural college professor ordered five cans, thinking that there was a gallon in each. He was much surprised when his bill was over $50. However, as he was a botanist with much sympathy for bee men, he coughed up the cash cheerfully and his children are the happier for his carelessness.

Utah.

CELL PRODUCTION

By H. Brenner

To receive the largest percentage of prolific queens it is important that the larvæ be supplied, from the earliest stage, abundantly with food. Take a comb with just hatching larvæ from the best breeders. Cut out single cells containing larvæ of the same age and fasten with hot wax to the top-bar of the empty frame, space the cells so you will have about 18 to the bar. Destroy with a toothpick the larvæ in the double cells and on the under side of the mid rib and give the frame to the cell-rearing colony. Prepare according to the strength of the colony another bar or two, and fasten in the same frame. If the colony is in the right condition for cell-rearing you will find the cells under the top bar started already when you insert the second bar. With this method the larvæ are never starving or without food. I take larvæ of the same age so the cells ripen at the same time. To prepare the colony for cell rearing. I make it queenless and do not bother it for three days. The third day I take away all the sealed brood, larvæ and eggs, destroy the queen-cells and leave in the center, between two frames of sealed brood, space for the cell frame. I have then a queenless colony without any larvæ or eggs, ready to supply any number of queen-cells with larval food, waiting for the cell bars. In using artificial cell-cups I found that the bees eat up the given royal jelly first and clean the cups before they take care of the transferred larvæ. In doing this work some of the larvæ perish. I advise beekeepers to read Pellett's book on queen-rearing.

Texas.

ODDS AND ENDS

Where Bees May Be Kept

Whereas some country yieldeth one fruit, some another; some beareth one grain, some another; some breedeth one kind of cattle, some another; there is no ground, of what nature soever it be, hot or cold, wet or dry, hill or dale, woodland of champian, meadow, pasture or arable; in a word, whether it be battle or barren, which yieldeth not matter for the bee to work upon. —Chas. Butler. The Feminine Monarchie, 1623.

Gypsum for Alfalfa Yields

A recent article in "Cement, Mill and Quarry" calls attention to the great value of agricultural gypsum in increasing the yield of alfalfa in the west. Who knows but that the addition of some fertilizer may result in increasing secretion of nectar from alfalfa in the east? Our experiment stations are yet in their infancy.

A Live Organization

The Vigo County, Indiana, beekeepers have an organization which keeps things moving. They hold summer tours and winter meetings, and never allow interest to lag. They held a short course of two days at Terre Haute on February 24 and 25, attended by about 60 beekeepers. The instructors were C. O. Yost, Jay Smith, E. W. Atkins, beside local beekeepers, including R. B. Davis, of Staunton, Indiana, and the officers of the Association.

William A. Hunter was re-elected President, Frank Teel Vice President and George E. Osburn was chosen to succeed Mr. Rainbolt as Secretary.

Adulterated Honey

Relative to the article in the Chicago Evening American by Brice Belden, M. D., stating that honey is one of the things most extensively adulterated, I wish to say that the editorial in the February issue is timely. Some action must be taken when charges like these are made. On December 28, 1920, I received a letter from Frank C. Pellett, containing the same information as published in the Journal. The same day I wrote to the American and to Dr. Belden through that paper asking for a confirmation of this statement and offered the aid of the League to help in rectifying this situation. Up to this day (Feb. 4, 1921), I have received no reply to these letters, neither have the letters been returned.

As I have no such information or accusations from beekeepers in the Chicago district, nor was any such statement made at the December, 1920, meeting of the Chicago Northwestern Beekeepers' Association, I believe it is the duty of the American to make a statement defending the article mentioned. If they have proof of their statement, then the beekeepers should, through the League and the bee journals, correct this situation. If the paper cannot show that adulterated honey was commonly sold, then this paper owes to the beekeepers and honey dealers of America an apology. H. B. Parks,
Secretary American Honey Producers' League.

Bee Stings Kill Team

Danville, Va.—Two horses belonging to a Patrick County orchard company were stung to death, and Mrs. Audrey Rickman was rendered unconscious when attacked by a swarm of bees. The horses, harnessed, overturned a beehive in their restlessness, and brought out the bees.

Goaded by stings, the team ran amuck and upset 18 more bee stands, with the result that a cloud of many thousands settled on the beasts which, becoming entangled in the harness, fell helpless to the ground.—News Item.

A Good Start

I had one colony on 10 Langstroth frames and 6 shallow extracting combs to begin with. I have transferred onto Jumbo frames with 1½-inch spacing. I have increased that one colony to six colonies, all on Jumbo frames, in Dadant hives. July 4 I bought a 3-pound package of bees and queen. My first nucleus was made June 25, and the last one on July 10. I bought queens to introduce to the new divisions. As to the amount of honey: I have taken 101 sections, the lightest weighing 14¾ oz. net, and the heaviest weighing 16¾ oz. net. Then I have 80 pounds of extracted honey, beside frames of honey that weigh 38 pounds that I saved to feed if it were necessary. I have now 7 rousing big colonies, with their combs solid full of honey for winter, and have stored away 56 shallow extracting combs for use next spring.

This has been my introduction to the bees, and I have had royal good time, beside a profitable one, having sold 73 sections for 50 cents each, and 50 pounds extracted honey for 50 cents a pound.

I am afraid spring is a long time in coming.

Yours truly,
Ransom A Race.

Massachusetts.

Honey From City Shade Trees

In the city of Washington there are about 10,000 basswood trees within a radius of two miles of Iowa circle. An enterprising beekeeper, Harold L. Kelley, of Forest Glen, Maryland, moves his bees into the city for the flow and gets an average crop of

about 35 pounds per colony of basswood honey.

There are many cities where basswood, maples or other trees which yield nectar freely are sufficiently plentiful to afford a good flow of nectar for a short period. It sounds like a novel idea to move the bees to the city for a honey flow, but Mr. Kelley seems to have found it profitable.

Short Courses for Beekeepers in Western Washington

During January and February there were eight schools or short courses for beekeepers in Western Washington. They were held at Wishkah, Elma, Olympia, Puyallup, Seattle, Shelton, Everett and Bellingham. There was a total of nearly 1,000 present at all the short courses.

The Seattle school was best attended, there being nearly 400 people who were interested enough to remain for five-day sessions and two night sessions. And the interest was intense throughout the entire eight short courses.

The principal instructors were Dr. A. L. Melander, of the State College at Pullman; W. L. Cox, of Elma, the bee inspector for Gray's Harbor County; Fred Mandery, of Tenino, the bee inspector of Thurston County, and George W. York, of Spokane.

Hives Too Close Together

"When in New Zealand, I told the beekeepers there that I thought their method of placing colonies so close together was largely responsible for the spread of foulbrood. My experience since, in the United States, confirms me in that opinion."—W. S. Pender, in Australasian Beekeeper.

Since the keeping of colonies too close together is already responsible for the loss of young queens, by mistakes in entering the hive upon the return from their wedding flight, we see an additional objection in the above statement from a man who has very practical knowledge. The colonies should always be so placed that the bees may readily recognize their own hive.—Editor.

More Census Reports

There were 47,285 colonies of bees in Oregon in 1909, as compared with 45,254 in 1919. The 1919 honey crop was 929,566 pounds, or a per colony production of 19 pounds.

Indiana reports 87,045 colonies in 1919, as against 80,938 in 1909. No report on honey yields given.

Colorado had 63,253 colonies in 1919 as against 71,434 colonies in 1910.

Tennessee Joins the American Honey Producers' League

Tennessee did herself proud on the question of joining the League at the January meeting. The Secretary had just given out a financial statement showing that the association had only $29 in the treasury. There were not more than 60 members present. But when the circular letter from the secretary of the League was read, urging all State Associations to join, Mrs. Grace Allen made a motion to join. It was seconded.

Our editor, who was present, made a few remarks upon the advisability of the beekeepers of the United States being united for the purpose of advertising their honey, to foster extension work, fight diseases, standardize equipment, get pure food laws in the States, keep every one posted in regard to prices and markets, etc. A wave of enthusiasm ran through the meeting. Mr. Ben G. Davis offered $25 of the $100 needed, in his and his father's names. The balance of the subscription was put together in a few minutes. Glory to Tennessee! If the beekeepeers thus support an American League, success in steady honey prices will be assured. All we need is to unite, as the citrus producers did.

Beekeeping in Canada

The Canadian Government has seventeen apiaries on the various experimental farms scattered over the Dominion. In the January number of the Horticulturist and Beekeeper, F. W. L. Sladen states that records of the returns from these apiaries are available since 1912. The average per colony production per year varies from 18 pounds in the least profitable apiary to 133 pounds in the most profitable one. It is presumed that the difference is largely one of location. An average of 133 pounds per colony for a period of eight years is certainly a good record. However, the fact that all the apiaries in the 17 different locations in all sections of Canada averaged 63 pounds indicates that Canada offers very favorable conditions for honey production.

Revival of Split Sections

So little has been said about split sections of late that many of the younger generation of beekeepers have never heard of them. It is possible to get a very fine article of comb honey by the use of the split section, since the foundation is held in place between the split edges of the wood. Since some extra labor is necessary in their use, they have never proved popular.

We were greatly surprised to learn that a patent has very recently been issued to Harry C. Hartman, of Braddyville, Iowa, on split sections. It seems that no application for patent on such use of the sections for comb honey had ever been filed.

We are interested in learning just when split sections were first used and where they first appeared.

Mr. Hartman has also received a patent on a vertical metal support in the center of the brood-frame to be used in place of wires. It is somewhat similar in effect to Dr. Miller's wood splints, except that it is attached to the frame both at top and bottom.

Essex County Meet

The Essex County Beekeepers' Association was formed January 20, at Newark, N. J..

C. W. Feiganspan, of Newark, was elected Honorary President; Rev. A. S. Zimmerman, Newark, President; Julius Meier, Newark, First Vice President; B. B. Osborn, Kearney, Second Vice President, and Chas. Ledig, Irvington, Secretary-Treasurer.

J. H. M. Cook, of Roseland, and Rev. Zimmerman gave interesting talks, assisted with lantern slides.

At the second meeting, held February 10, C. H. Root, of Red Bank, and E. G. Carr, Deputy Bee Inspector for the State, both gave very instructive talks.

The next meeting was held Thursday, March 10, in City Hall, Newark.

Chas. Ledig, Secretary.

League Notes

J. J. Wilder, of Waycross, Ga., editor of the Dixie Beekeeper, represented the League in the Southern Tariff Congress held at Atlanta, Ga., January 27-29. Mr. Wilder was successful in having honey placed on the list of agricultural products which that body is recommending for tariff to the National Congress. Mr. Wilder reports that the interests allied in this Congress were glad to receive the aid of the beekeepers.

Clifford Muth, Chairman of the Special Advertising Committee, reports that his committee is progressing nicely and has made arrangements for the advertising and has secured a greater part of the funds required.

C. B. Baxter, of Leavenworth, Kans., and Corona, Calif., writes that he is getting material together on standardization and finds that he has a big and important job. He further states the League is creating much favorable comment and action on the West Coast.

The California prune growers are to spend $325,000 in 1921 advertising prunes. How's that, fellow beekeepers? Is the League going to get your support?

C. W. Kitchen, of the Bureau of Markets, Washington, D. C., writes that he desires to co-operate with the League's Marketing Committee and asks the aid of the League in giving the honey producers of America a better market report.

H. B. Parks, Secretary.

Use of Propolis

Propolis is recommended for ladies to use on their faces in place of cold cream, to putty up the wrinkles before putting on rouge and powder. The old bachelor beekeepers, readers of the Air Line Review, are sure to be taken in by this treatment.—B. B. Gum, Hot Town, La.

Bees Winter Well in Ohio

Bees went into winter quarters in good condition following a heavy honey flow. The winter was very mild, the temperature dropping to

zero only once. I winter on summer stands, with three or four inches of packing on top of the frames, and have never lost a single colony so protected. We have woods to break the wind. C. W. Chambers,
Brookville, Ohio.

British Columbia Beekeeping

A new publication entitled "Beekeeping in the Interior of British Columbia," has recently been issued by the British Columbia Honey Producers' Association. It contains sixteen pages, illustrated with photographs and drawings. The methods of honey production best suited to the conditions of the Province are briefly and clearly outlined. Our Canadian friends set a good example, which may well be followed by organizations of beekeepers elsewhere.

Bees and Honey

"Bees and Honey" is the name of a little publication issued every little while by the Alameda County, California Beekeepers' Association. It seems that whenever the secretary has important news for the members, the paper is issued. It is a novel idea and interesting to all bee fanciers. The last issue, dealing with the annual convention of the State Association which met with the Alameda folks, contains 32 pages and has the appearance of quite a pretentious bee magazine.

California has some live ones in the honey producing business. Ever since the days of Harbison, they have insisted on producing more honey than anybody else, and not only do they produce good honey, but they advertise the fact in a way to make the rest of the world sit up and take notice.

Chicago Beekeepers Meet

On February 15 the beekeepers of Chicago and vicinity held a meeting at the Chicago Business College Hall. The hall proved too small for the number that attended, so it became necessary to divide the company and hold two meetings. It is expected that a permanent organization will result and that beekeepers of that vicinity will hold frequent meetings in winter, with apiary demonstrations in summer.

THE EDITOR'S ANSWERS

Questions are answered in order received. As we receive more questions than we can answer in space available, two or three months sometimes elapse before answers appear.

Repairing Combs

1. (a) In replacing drone-comb is it best to fit in pieces of worker-comb singly and let the bees straighten out crushed cells, or can foundation be fitted in? (b) Is it true that brood-comb should be cut out every 4 or 5 years, as some claim that bees become smaller, owing to a lining accumulated in cells by hatching of the young bees?

2. Bees wintered in cellar with a queen-excluder on hive to keep out mice, should the cover be pulled back to give ventilation, and how far?

3. How soon can bees be taken out of cellar? WISCONSIN.

Answers.—Yes, fit pieces of worker combs in the spaces formerly occupied with drone-comb. Otherwise the bees will rebuild drone-comb. It is better to have some pieces of already built comb, as they can be adjusted better than pieces of foundation.

b. No, it takes 15 years or more to make cells too small for workers.

2. We would give a certain amount of ventilation according to the strength of the swarm. We have wintered bees in the cellar with the entire top open. Give them an inch or so at least.

3. Take bees out of cellar at the first warm days of spring. Dr. Miller said "when the first soft maple bloom is out." Do not take them out on cold days

Oregon

1. There is a late flow here now (Sept. 11). The bees are coming in with a white pollen all over their bodies. Could you tell me what it is?

2. If I feed the colonies short of stores about the last of September would much of the honey be used in brood-rearing?

3. How many extracting colonies could one man keep successfully (keeping bees only)?

4. About how much honey does one colony require here for winter stores if they are wintered in double-walled hives, medium strong colonies. On the average it goes 10 degrees below zero.

5 How late should brood be reared to prevent spring dwindling?

6. There is about one pound of real dark brown honey (cappings) in each hive. Please tell me what it is. OREGON.

Answers.—1. We are not acquainted with the flora of Oregon. You are better placed than we are to find the plant on which your bees gather that white pollen. If you find it, just mail us a plant, root, stem and blossom, and we will do our best to give you its name.

2. If you feed at once as large a quantity as they will take readily, they will not do much brood-rearing. It is when you feed slowly, a little at a time, that the bees do much brood-rearing

3. An active man might take care of 500 to 700 colonies, if things are conveniently arranged.

4. Better figure on 30 to 40 pounds of honey for a colony to reach from one crop to the other, unless you have plenty of bloom yielding honey in spring, which is rather exceptional.

5. Brood should be reared as long as bees fly freely every day. The quantity lessens from day to day at the approach of cold weather.

6 That dark honey may be honeydew. Send us a sample of it.

Locations

1. Having had some experience with bees, I intend to move to some place where I can embark in the bee business. Can you give me any information as to Colorado, Southern Utah, Southern California, or Texas?

2. In Mr. Frank C. Pellett's book, "American Honey Plants," does he give the location of all the different plants? MINNESOTA.

Answers.—1. Colorado, Utah, California and Texas are the best State for bees, but you must go there and make your selection for locations, for there are good and bad spots in all those States A trip in either of them will give you the necessary information.

2. "American Honey Plants" gives the location of the different plants and also gives a list of the honey plants of each State.

Flight of Queen

1. Does a laying queen take exercising flight? A queen breeder has told me he does not believe in cutting a queen' wings, as it prevents her from taking exercising flights.

2. When keeping royal jelly from one season to another, must the larvæ be picked out? MARYLAND.

Answers.—1. No, a queen never flies except when she mates, at the age of 6 to 10 days, or when she goes out with a swarm. Tell

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Quality is first—save time when you put your goods together, by getting supplies that are accurately made. Service is next—no delays when bee supplies are ordered from my factory.

I am ready to meet your urgent needs.

Send for my new price list.

Closing out all Langstroth and Wisconsin hives and supers. Also Langstroth triangular top-bar frames and eight-frame D. T. supers for 4x5 sections. Will sell at cost price. Write for quotations.

CHAS. MONDENG

146 Newton Ave. N. and 159 Cedar Lake Rd. Minneapolis, Minn.

that queen-breeder to get better informed.

2 I can't see any use in keeping royal jelly from one season to another. But when you do keep any, you should, of course, remove the larvæ. If you don't, they will either get cold and die and decay, or they will eat up your royal jelly and then die anyhow.

Honey for Candy

How long should honey be boiled for use in queen candy? I notice in Professor White's article, in October number, that the time seems to have been lengthened since Dr. Phillips' experiments a few years ago.

CALIFORNIA.

Answer.—The bacteriologists and entomologists have warned us for some time past of the necessity of boiling honey for a half hour, when it is used to feed bees.

Dr. Burton N. Gates, Bulletin No. 75, Department of Agriculture, 1908, page 29, "Bee Diseases in Massachusetts," wrote:

"It is safe to feed honey to bees only when it has been vigorously boiled for at least a half hour. . . . "

Dr. E. F. Phillips, "Treatment of Bee Diseases," Bulletin 442, Department of Agriculture, 1911, page 17, wrote:

"Honey can safely be used for feeding bees, provided it is diluted with at least an equal volume of water, to prevent burning, and boiled in a closed vessel for not less than one-half hour, counting from the time that the diluted honey first boils vigorously." This authority repeats the same recommendation in Bulletin 1084, of the same Department, "Control of American Foulbrood," dated March, 1920.

On page 340 of the October number of this magazine, Dr. White wrote: "When the spores from the scale material were suspended in water and heated to boiling point (212 F.) they were all killed in 11 minutes. A half hour or more may be necessary when they are in honey"

In our own work, "The Hive and Honey-Bee," Langstroth Revised, we have recommended for years, paragraph 795, "when either honey or beeswax is heated to kill the germs of foulbrood, to keep the liquid at the boiling point for a couple of hours at least."

A thing that we did not know until lately, though we may have simply overlooked it, is that the bacilli die more quickly in hot water than in hot honey. See paragraph above from Dr. White. It behooves all queen-breeders to rather overdo the heating of honey, for nothing will hurt a queen-breeder's reputation more than to have it thought that he is careless about such a matter.

Fence For Apiary

I am living on the outside of town, but in the city limits I have only one neighbor near me. I am trying hard not to interfere with anybody. I have at present 78 colonies and am thinking of increasing to 150. I have begun to make a high board fence and thinking of having a high fence all around them. There is no shade in the bee-yard yet. Would it be too warm in summer to have an almost tight fence around them? Would you think that the city could compel me to move the bees? I have 5 lots where I have my bee-yard, so I am not too near the road.

WISCONSIN.

Answer.—It would probably be rather warm in the summer to have a tight board fence all around your bee-yard. But this is not indispensable. A wire netting 10 or 12 feet high would be just about as efficient as a tight fence. Bees will not fly through a mesh one-half to one inch in diameter. At least such a mesh is sufficient to induce them to fly above it, so they get out of the way of passing teams, etc. So we would suggest that you build a tight fence only on the windy sides and use netting on all other sides. This will avoid making the yard too hot in summer. We have seen such netting in use in Peoria, with very good results.

To sweeten a mean neighbor, give him a jar of honey occasionally. It may seem hard to do it the first time. But you will see his face brighten, and the second time you give him some he will be quite a different man.

To prevent trouble with neighbors and passers by, you should never handle your bees without smoke Never allow any one to jar a hive unless it has been previously smoked, at the entrance first, and over the combs when opened. There is no necessity for cross bees. If some colony is unreasonably cross, change the queen in the spring as soon as you can get one. Keep only pure Italian bees. They are much more gentle than the common or black bee, or the hybrid. Make it a point to have gentle bees.

As to the city compelling you to move your bees, that is out of the question. They can have you fined, if your bees do any damage. People who get stung by them may obtain damages. But no law can be passed making bees a nuisance within a city. It has been tried before. But you should keep your bees in such a way as not to make them obnoxious to any one. It can be done by following these suggestions.

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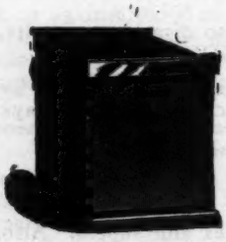

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Copy for this department must reach us not later than the 20th of the month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

SWEET CLOVER SEED

ANNUAL WHITE SWEET CLOVER SEED —The new forage plant that will grow from 4 to 8 feet high and bloom and mature seed in 90 days. Our seed was grown at Ames, Iowa, and is first-class seed, hulled and scarified. We have only a small quantity to offer, put up in 1-ounce packages, at $1 each, postpaid.
Colorado Honey Producers, Denver, Colo.

BEST quality white sweet clover seed, raised on my farm in Nebraska, cleaned and scarified, at $12 per bushel. In less quantities 25c per pound. Frank C. Pellett, Hamilton, Ill.

BEES AND QUEENS

Lower Price. Top Quality. Atwater's Honey.

EARLY QUEENS—Beginning to ship about May 20, 3-banded Italians; don't monkey with poor queens; get something worth while. One untested queen, $1.50; 6 for $8; select tested, 1 $3; 6 for $15. See prices for bees in the February and March numbers of the American Bee Journal.
J. W. Bittenbender, Knoxville, Iowa.

CARNIOLANS for season of 1921. Gentle, prolific; wonderful honey gatherers. Circular and prices free. Alfred Hann,
Box 81, Glen Gardner, N. J.

ITALIAN QUEENS—Three-banded, select untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness, and perfect markings. Price, May and June: $1.50 each, 12 or more $1.25 each. Send for circular.
J. H. Haughey & Co., Berrien Springs, Mich.

FOR SALE—Queens—Limited quantity, price $1.25 each. One-third books order for June delivery, balance one week before delivery.
Willard A. Friend, R. 2, Box 112, Bedford, O.

PURE ITALIAN QUEENS, $2 each.
F Barber, Lowville, N. Y.

BY RETURN MAIL—Tested Italian Queens, $2.50 each. We guarantee safe arrival, satisfaction and *no disease.*
J. W. K. Shaw & Co., Loreauville, La.

FOR SALE—Three-frame nuclei, with leather-colored Italian queen (frames with brood and honey and about 2 pounds of bees), $10 each, by express, not prepaid. Delivery from May 15 J. S. Morales,
115 Vermilyea Ave. New York City, N Y.

QUEENS ON APPROVAL—Bees by package or colony. Have your order booked now. Send money by May 1. A. M. Applegate,
840 Main St., Reynoldsville, Pa.

FOR SALE—Three-banded Italian queens ready June 1. Day old virgins, 55c each. Select untested, $1.50 each; 6, $8; 12, $15; 50, $60. Nuclei with queens, 2-frame $7.50; 3-frame $10.50. No disease; satisfaction guaranteed and correspondence answered promptly.
A. E. Crandall, Berlin, Conn.

MR. BEEKEEPER—If you enjoy preparing supers and removing honey, then you will be wise to head your colonies with my vigorous Italians. See larger add elsewhere.
Herman McConnell, Robinson, Ill.

FOR SALE—A limited number of leather colored Italian queens, the kind that gets the honey. L. C. Keet, in 1919, produced 40,000 pounds of honey from 200 colonies.
Geo. B. Howe, Sackets Harbor, N. Y.

QUEENS ON APPROVAL—Bees by package or colony. Have your order booked now. Send money by May 1st.
Birdie M. Hartle, 924 Pleasant St.,
Reynoldsville, Pa.

FOR SALE—Nuclei and queens. See our display advertisement.
Cotton Belt Apiaries, Roxton, Texas.

FOR SALE—Unsurpassed Italian queens, ready June 1; untested, $1.50; 6, $7.50; 12, $14; 50, $55; 100, $105. Tested, 1, $2.50; 6, $13.50. My queens are actually laying before they are sent out.
J. D. Harrah, Freewater, Oregon.

BEES from my queens would not excel at an exhibit, but they are hard to beat any place else. Circular tells more about them.
R. V. Stearns, Brady, Texas.

FOR SALE—Limited number of three-frame nuclei, pure three-banded Italians with tested queens only. For April delivery. No disease. Inspection certificate. Satisfaction or money back guarantee. Price $9.
Geo. R. Mitchell, Booneville, Miss.

FOR SALE—Three-banded Italian bees and queens, April and May, untested queen $1.50, tested $2.50; 2-lbs. bees $4.50. Add price of queen wanted. Safe delivery and satisfaction guaranteed.
J. L. Leath, Corinth, Miss.

FOR SALE—Hardy northern bred Italian queens and bees, each and every queen warranted satisfact ry. For prices and further information write for circular.
H. G. Quirin, Bellevue, Ohio.

WONDERFUL QUEENS at wonderful prices; no complaints last year. Untested, $1.50; tested, $3; virgins, 50c.
F. M. Russell, Roxbury, Ohio.

THAGARD'S ITALIAN QUEENS—My 3-banded are "bred for quality"; try them and be convinced. Circular free.
V. R. Thagard, Greenville, Ala.

GUARANTEED ITALIAN QUEENS AND BEES. Orders filled day received. See larger add elsewhere. Dr. White Bee Co.,
P. O. Box 71, Sandia, Texas.

PACKAGE BEES and nuclei, also Italian queens. No disease in this section. Years of experience in shipping bees. For prices and terms address
Allenvile Apiaries, Allenville, Ala.

HEAVY LAYING Italian queens that produce hustling 3-banded workers. Untested, $1.25; tested, $2. Safe delivery and satisfaction guaranteed. There is no disease in my apiaries. Order now and get them on time.
P. M. Williams, Ft. Deposit, Ala

FOR SPRING DELIVERY—One good Italian queen, 1 Hoffman standard frame emerging brood, 1 pound live bees, price complete $6.50, f. o. b. Bordelonville. Queen introduced, mated, laying enroute; loss in transit replaced if noted on express tag by agent; no disease in State. References given. Orders booked, May delivery, one-fifth cash. Orders filled in rotation. Successor to J. F. Archdeken,
Jess Dalton, Bordelonville, La.

MOTT'S NORTHERN BRED ITALIAN QUEENS—Select untested, $1.50; 6, $8.50; 12, $15. Select guaranteed pure, or replace, $1.75. Select tested, $2.50 each. Plans "How to Introduce Queens, and Increase," 25c. E. E. Mott, Glenwood, Mich.

FOR SALE—Pure Italian queens and nuclei. One untested queen, $1.50; 12, $15. Tested queens, $2.50 each. Nuclei, 2-frame nucleus, $5; 3-frame, $6.50. Add price of queen wanted to price of nucleus. Frank Bornhoffer,
Rt. 17, Mt. Washington, Ohio.

BEES AND QUEENS from my Carolina apiaries, progeny of my famous Porto Rican pedigreed breeding stock.
Elton Warner, Asheville, N. C.

FOR SALE—Golden or 3-banded virgins, 60c each, or $6 per dozen; safe arrival.
R. O. Cox, Rt. 4, Luverne, Ala.

SWARTS' Golden queens produce golden bees of the highest quality. Untested $1.50 each, 6 for $8; tested, $3. Satisfaction guaranteed.
D. L. Swarts, Lancaster, Ohio, Rt. 2.

BEES—2-pound packages, with queens from our best breeders, 3-band strain; 1 package and queen $5.50; 25 or more, $5.25 each. One-fourth cash books your order. Safe arrival guaranteed. Promptness and efficiency our motto. Caney Valley Apiaries,
J. D. Yancey, Mgr., Bay City, Texas.

DAY-OLD ITALIAN QUEENS—High quality, low price, satisfied customers. Safe arrival guaranteed in U. S. and Canada. Safe introduction Prices: 1, 75c; 12, $7.20; 100, $60. Write for circular early.
James McKee, Riverside, Calif.

BEES BY THE POUND—Also pure-bred queens. Booking orders now for delivery after March 15. Everything guaranteed.
Brazos Valley Apiaries, Gause, Texas.

FOR SALE—Black bees, 3 lbs. and queen for $6.25, parcel post prepaid. One-fourth down, balance just before shipping. Can ship beginning April 10.
Carl L. Wilson, Mount Vernon, Ga.

FOR SALE—Leather colored Italian queens, tested, until June 1, $2.50; after, $2. Untested, $1.25; 12, $13. Root's goods at Root's prices. A. W. Yates,
15 Chapman St., Hartford, Conn.

HARDY ITALIAN QUEENS, $1 each.
W. G. Lauver, Middletown, Pa.

FOR SALE—Honey Brook Farm can supply you promptly, beginning April 10, with the very best three-banded Italian queens, one grade, select untested, $1.50 each, or $15 per dozen. Tested, $2 each, straight; ready April 1. Should you find some queenless colonies this spring, send me your order for a young queen to save them. I will not disappoint you. I have the bees and can deliver the goods. Pure mating, safe arrival, and satisfaction guaranteed.
Jasper Knight, Hayneville, Ala.

1921 PRICES on nuclei and queens: 1-frame nucleus, $3; 2-frame nucleus, $5; 3-frame nucleus, $6.50; without queens, f. o. b. Macon, Miss.; 5 per cent discount on lots of 25 or more. Untested queens $1.50 each, $15 per doz; tested queens $2 each, $22 per doz. No. disease; inspection certificate with each shipment. Safe arrival and satisfaction guaranteed in U. S.. Queens sold only with nuclei.
Geo. A. Hummer & Sons, Prairie Point, Miss

WE want to please you. Our reliable three-banded queens and bees will be ready May 1. All bees are shipped on a standard frame of brood and honey. 1-lb. package bees, no queen, $3.25; 2-lb, $4.50; 3-lb. $5.75. One frame nuclei, no queen, $2.75; 2-frame, $4. Queens, untested, $1.50 each. One-fourth down will book your order.
Oscar Mayeux, Box 16, Hamburg, La.

FOR SALE—Bees for strengthening purposes, 3-frame nuclei of hybrid or black bees on frames containing brood, at $5.25 f. o. b. Lyons, Ga. No queens included; none for sale. Will be able to start shipping April 20. No disease; safe arrival guaranteed if express agent notes loss on express tag. One-third cash with order. Book your orders at once, as number of nuclei for shipment will be limited.
Otto Diestel, Elza, Ga.

FOR SALE—Utopian quality Italian queens, the kind that satisfy. May 15 to June 10, untested, $2 each. After June 10, untested, $1.50 each, 6, $8. Virgins, 90c each; 6, $4.75.
Utopian Apiaries, Amboy, Minn.

THE ITALIAN QUEENS OF WINDMERE are superior three-banded stock. Untested, $1.50 each, six for $8; tested, $2.50 each; select tested, $3. Bees by the pound; write for prices. Prof. W. A. Matheny,
Ohio University, Athens, Ohio.

FOR SALE—Golden Italian queens, untested, $1.50 each, dozen $14. Bees by the pound a specialty. Write for prices on bees.
E. A. Simmons, Greenville, Ala.

FOR SALE—Queens and bees, Italians and goldens, $1.50 each, $15 per dozen; 1 lb. bees, $5, 2 lbs. bees, $9. If queen is wanted with bees add the price of queen. Safe arrival and satisfaction guaranteed in United States or Canada. Cash or certified check must accompany all orders where parties are not known or satisfactorily rated.
Graydon Bros., Rt. 4, Greenville, Ala.

WE are now booking orders for early spring delivery of two and three-frame nuclei, with untested or tested queens. Write for prices and terms. We also manufacture cypress hives and frames.
Sarasota Bee Co., Sarasota, Fla.

THREE-BANDED ITALIANS only, that have been bred to a high standard of excellence. I never had any disease in my apiary. Safe arrival and satisfaction guaranteed. Untested queens: 1, $1.50; 12, $15. Tested queens: 1, $2.25; 12, $25.
Jul Buegeler, New Ulm, Texas.

FOR SALE—Three-banded; Italian queens untested, $1.50 each; 6, $7.50; 12, $14. Select untested, $1.75 each; satisfaction guaranteed. W. T. Perdue & Sons,
R. No. 1, ort Deposit, Ala.

FOR SALE—Root's strain of golden and leather-colored Italian queens; bees by the pound and nuclei. Untested queens, $1.50 each; select untested, $2 each; tested, $2.50 each; select tested, $3 each. For larger lots write. Circular free. A. J. Pinard,
440 N. 6th St., San Jose, Calif.

NUCLEI FOR 1921—Now booking orders for 1921 delivery. Italian nuclei (with queen), $6.50 each. Hybrid bees, with pure Italian queen, $5.50 each. Terms, one-third down with order. No disease. Safe arrival and satisfaction guaranteed.
A. R. Irish, Doctortown, Ga.

THREE-BAND BREEDERS from one of the heaviest honey-gathering strains in the State. $10 each. Delivery May 15.
A. V. Small, Augusta, Kans.

WE are booking orders for our golden Italian queens for spring delivery after April 15. Untested queens, 1, $1.50; doz., $15; select untested queens, 1, $1.75; doz., $18; virgin queens, 1, 75c; doz., $9; tested queens, 1, $3; doz., $36 Safe arrival guaranteed.
Tillery Brothers, Georgiana, Ala.

FOR SALE—Large, hardy, prolific queens: 3-banded Italians and golden; pure mating and safe arrival guaranteed. We ship only queens that are top notchers in size, prolificness and color. Untested, $2 each; 6, for $11; 25 for $45; tested queens $3 each, 6 for $16.
Buckeye Bee Co., Box 448 Massillon, Ohio.

BOOK YOUR ORDERS for QUEENS now—Goldens, $2; tested, $3; banded, $1.50; tested, $2.50; six or more, 10 per cent less.
Clover Leaf Apiaries, Wahoo, Neb.

EDSON APIARIES now booking orders for queen bees for delivery during season of 1921. Prices: One untested queen, $1.25; 50 untested queens, $57.50; 100 untested queens, $100. Orders filled in rotation; first shipments March 1, 1921.
Edson Apiaries, Gridley, Calif.

PURE ITALIAN QUEENS—Golden or leather colored, packages and nuclei; 1 untested queen, $1.50; 6, $7.50; 12, $13.50; 50, $55; 100, $100; virgins, 50c each; packages, 24 and under, $2.25 per pound; 25 and over, $2 per pound; nuclei, 1-frame, $4; 2-frame, $6; 3-frame, $7.50; queens extra. One-story 10-frame colony with queen, $12.
Golden Star Apiaries,
R. 3, Box 166, Chico, Calif.

BEES AND QUEENS from my New Jersey apiary J. H. M. Cook,
1Atf 84 Cortland St., New York City.

PACKAGE BEES AND PURE ITALIAN QUEENS—Booking orders now for spring delivery. Circular free. J. E. Wing,
155 Schiele Ave., San Jose, Calif.

HIGH GRADE ITALIAN QUEENS—Send for catalog.
Jay Smith, R. 3, Vincennes, Ind.

BEES BY THE POUND, ALSO QUEENS—Booking orders now. Free circular gives prices, etc. See larger ad elsewhere.
Nueces County Apiaries, Calallen, Texas,
E. B. Ault, Prop.

HONEY AND BEESWAX

Lower Price. Top Quality. Atwater's Honey.

HONEY—15c per pound. Walter Reppert,
Gen. Deliv., Shreveport, La.

FOR SALE—Very fine quality basswood-milkweed (mostly milkweed) honey in 60-pound cans. F. W. Sowinski, Bellaire, Mich.

FOR SALE—Gallberry honey in cypress barrels; will sell for best offer.
J. G. Puett, Americus, Ga.

FOR SALE—White clover comb honey; also extracted in 10-lb. pails.
W. L. Ritter, Genoa, Ill.

FOR SALE—Finest grade honey, in 10-lb. pails; same quality as bottled, $2.40 per pail in single pail or case lots of 6. Also in glass jars of 1 pound, 1½ pounds and 3 pounds. Packed and guaranteed to carry safely anywhere. Prices on application.
Merton Church, Highland Park, Ill.

FOR SALE—Choice clover extracted honey. State quantity wanted.
J. D. Beals, Oto, Iowa.

FOR SALE—Best quality clover-basswood extracted honey; two 60-lb. cans in case.
Gelser Bros., Dalton, N. Y.

FOR SALE—Louisiana honey.
Arthur Kuersten, Burlington, Iowa.

FOR SALE—Well ripened extracted clover honey, 20c per pound. Amber and buckwheat extracted 17c, in 60-lb cans. Five-pound pail clover $1.25. Buckwheat and amber $1 per pail. Light amber in barrels 12½c per pound; also have a dozen cases buckwheat comb at $5 and $6 per case of 24 sections.
H. G. Quirin, Bellevue, Ohio.

FOR SALE—Choice white clover extracted honey, $20 per case of 2 60-lb. cans, f. o. b. Holgate. Noah Bordner, Holgate, Ohio.

FOR SALE—Choice light amber honey in 60-lb. cans; also in 10 and 5-lb. pails. Please write for price and sample.
F. W. Luebeck, R. 2, Knox, Ind.

FOR SALE—Extracted honey. Write for prices. A. L. Kildow, Putnam, Ill.

FOR SALE—Honey. Immediate shipment f. o. b. New York, in 60-lb tins: Calif. white orange, 19c lb.; Calif. white sage, 16c lb.; white sweet clover, 14c lb.; Calif. L. A. sage, 13c lb.; West Indian L. A., 10c lb.; West Indian L. A., 10-lb. tins, 6 per case, 15c lb.
Hoffman & Hauck, Woodhaven, N. Y.

NEW HONEY. NEW PRICES—Supply your customers, finest alfalfa-clover honey, extra strong cases, $11.50 for one 60-lb. can, $21.60 case of 2, all f. o. b. here. Write for prices large lots. Two carloads sold; plenty on hand.
E. F. Atwater, Box 37J, Meridian, Idaho.

WANTED—Helper in beeyard. Give age, experience and wages wanted on basis of board furnished.
Mathilde Candler, Cassville, Wis.

WANTED—Comb and extracted honey.
The L. H. Snider Apiaries, Auburn, Ind.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering. Fred W. Muth Co.,
204 Walnut St., Cincinnati, Ohio.

SUPPLIES

Lower Price. Top Quality. Atwater's Honey.

FOR SALE—200 new 10-frame Lewis white pine extracting supers; painted; new white frames, wired, full M. foundation; perfect workmanship, $5 each.
Francis Jager, St. Bonifacius, Minn.

SAVE BIG MONEY—Bargain supply catalog free. R. Kramske, 1104 Victor St.,
St. Louis, Mo.

FOR SALE—New hives and frames made to order. Let me save you money. Satisfaction guaranteed. F. D. Bowers, Sugar Grove, Pa.

FOR SALE—45 8-frame supers, K. D.; never been used, $55; 30 wood and 7 wire queen excluders, slightly used, $24. Ten Stirling covers with inner covers, nailed and painted, $20. Everything as good as new; $85 takes everything.
Earl H. Conrad, Lamoille, Nevada.

FOR SALE—200 absolutely new 10-frame hives complete, consisting of hive-bodies, tops, bottoms, tin rabbets, nails and Hoffman self-spacing frames knocked down, in lots of 5, $14; 200 full-depth supers with frames, $1.20 each; 500 lbs. of medium brood-foundation at 78c per pound
A. Irish, Doctortown, Ga.

HONEY EXTRACTORS at half price; compulsory sale. Write for particulars.
Seaman, South Connellsville, Pa.

FOR SALE—33 one-half depth supers with frames and 6 without frames, for 8-frame hives. These supers are white pine and dovetailed and in good condition; used but little, $25 takes the lot.
A. B. Marchant, Jesup, Ga.

FOR SALE—Full line of new and second-hand Jumbo and Langstroth bee supplies at modest prices. Send for complete list.
The Hoffman Apiaries, Janesville, Minn.

WANTED—To quote special prices on queen cages in quantity lots, to breeders. State quantity.
A. G. Woodman Co., Grand Rapids, Mich.

SAVE MONEY on your sections, shipping cases, tin and glass honey containers, etc. Our free price list tells you how.
The Rattray-Hamilton Co., Almont, Mich.

WRITE FOR PRICES on my cypress beehives and supplies.
J. Tom White, Dublin, Ga.

FOR SALE—Good second-hand double-deck comb honey shipping cases for 4¼x4¼x1⅞ sections, 25 cents per case, f. o. b. Cincinnati; terms cash with order.
C. H. W Weber & Co.,
2146 Central Ave., Cincinnati, O.

FOR SALE—Good second-hand empty 60-lb. honey cans, two cans to the case, at 60c per case, f. o. b. Cincinnati. Terms cash with order. C. H. W Weber & Co.,
2146 Central Ave., Cincinnati, O.

SEND us a list of goods wanted and will quote you lowest prices. We are the money-saving house. Price list free. Try us.
H. S. Duby & Son, St. Anne, Ill.

WANTED

Lower Price. Top Quality. Atwater's Honey.

WANTED—Bees in colonies, comb and extracted honey. Frank Coyle, Penfield, Ill.

WANTED—Brood foundation mill. State condition and price.
The Henseler Apiaries, Marshfield, Wis.

WANTED—Apiary on shares or to buy, by two experienced beemen. Address,
L, care American Bee Journal.

WANTED—Extractor; will pay cash; 100 Langstroth frames, $6.50.
Lorenzo Clarke, Winona, Minn.

WANTED—To exchange bees and queens for Hershiser wax press; same must be in good condition.
A. B. Marchant, Jesup, Ga.

WANTED—Comb honey; also 10 stands of bees. A. K. Reed, Barnett, Mo.

WANTED—Beeswax; also old combs and cappings to render on shares.
F J. Rettig, Wabash, Ind.

WANTED—Beeswax. At present we pay 34c per pound in cash and 36c in trade for clean yellow average wax, delivered Denver.
The Colorado Honey Producers' Association,
Denver, Colo.

WANTED—200 or less colonies of bees for spring delivery. Any style hive or box. Remembering 10c honey is in sight for 1921.
A. W. Smith, Birmingham, Mich.

WANTED—Bees, with or without location.
F. W Pease,
1717 Blake Boulevard, Cedar Rapids, Ia.

WANTED—Beeswax, old combs and cappings for rendering on shares. Also wax accepted for trade. Top market prices offered.
A. I. Root Co., Council Bluffs, Iowa.

WANTED—Your order for "Superior" Foundation. Prompt shipments at right prices.
Superior Honey Co., Ogden, Utah.

SITUATIONS

Lower Price. Top Quality. Atwater's Honey.

WANTED—Position by experienced beekeeper; can furnish diploma and give references.
Dimitri Petrechenko,
P. O. Box 325, Crum Lynne, Pa.

WANTED—Work at an apiary as helper, by Catholic. State wages if possible.
C. Prescher, 143 Bowery St., New York City.

WANTED—One experienced man and students, clean habits, able-bodied and willing workers, as helpers with our more than 1,000 colonies. Opportunity to learn the business from A to Z; 1920 crop 122,000 pounds; theory also. Write immediately, giving age, height, weight, habits, former employment, experience, references, wages, photo, all in first letter.
E. F. Atwater, Meridian, Idaho.
(Former Special Field Agent in Beekeeping, U. S. Department of Agriculture).

WANTED—Two young men, able-bodied, willing to work; clean in body and mind, who want to learn beekeeping and are willing to exchange faithful services for instruction from a man with almost forty years of extensive experience in beekeeping, board and some financial remuneration. Have twelve apiaries.
R. F. Holtermann, Brantford, Ont., Canada.

WANTED—Man with some experience to work with bees coming season. State age, experience and wages wanted, based on our furnishing board.
The Rocky Mountain Bee. Co.,
Box 1319, Billings, Mont.

WANTED—One experienced man, and students or helpers, in our large bee business; good chance to learn. Modern equipment and outfit, including auto truck; located near summer resorts. Write, giving age, height, weight, experience, reference and wages wanted.
W. A. Latshaw Co., Clarion, Mich.

WANTED—Two comb-honey men for season of 1921. Give experience, age, and wages expected.
B. F. Smith, Jr., Fromberg, Mont.

FOR SALE

Lower Price. Top Quality. Atwater's Honey.

FOR SALE—15 8-frame hives, empty; 13 8-frame supers; 5 hive stands. All painted and in good shape; used 2 years; no disease. Will sell all at a bargain. Will furnish inner fixtures if wanted.
John Hendricks, Zeeland, Mich.

FOR SALE—300 new Lewis beeware beeway sections, 77 section holders, separators, followers, springs for ten supers. Price $10.
J. M. Suliber,
5425 Minnesota Ave., St. Louis, Mo.

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.
Superior Honey Co., Ogden, Utah.

FOR SALE—Brand new 6x10 Excelsior printing press, types, rules, for cash. Some bee supplies, magazines. Offer on magazines.
Edwin Dahlquist, North Branch, Minn.

FOR SALE—Too many bees in town; will sell 40 colonies; also 1 No. 15 Cowan extractor. If interested write.
Geo. F. Schilling, State Center, Iowa.

FOR SALE—35 stands of bees. Ten hives are standard, 25 are sectional hives. All are 10-frame. 35 section supers; 25 extracting supers with drawn combs, all for $375, or best offer. Buyer to ship same.
L. A. Schwob,
1340 Merchant St., St. Louis, Mo.

FOR SALE—One 10-inch foundation mill, 2½ inch rolls, nearly new; can save cost of same in first 100 pounds foundation made. Also 6-inch mill, 2-inch rolls, in good condition.
W. D. Wright, Altamont, N. Y.

FOR SALE—20 10-frame used dovetailed hives in good condition; 300 Hoffman frames, some with good extracting combs, the balance good starter left from cut-out comb honey. All in good condition. No disease.
B. A. Manley, Milo, Iowa.

FOR SALE—Six colonies in 10-frame Standard hives, with supers, at $10 each, f. o. b. Tupelo. Also five new hives at half price. Write. Ben G. Lumpkin, Tupelo, Miss.

FOR SALE—Lot of new supplies, Lewis make; sections, foundation, hives, supers, covers, etc., at bargain prices. If interested, write for complete list.
C. C. Brinton, Bloomsburg, Pa.

FOR SALE—During the Mexican revolution, while unable to work on my ranches, I bought a few colonies of bees as a pastime. They have done wonderfully well, and I now have 200 good, strong colonies. As conditions have improved so much that I can again go back to work, I cannot give them needed personal attention, so will sell at a bargain. Good location, new equipment, no disease, and I own or control other localities suitable for outapiaries. This is a good opportunity to enter and develop a new field. Address
J. H. White, Tuxtepec, Oaxaca, Mexico.

FOR SALE—Owner wants use on one of our outside warehouses, so we must move this stock; slightly dusty and shopworn: 1-story 8-frame hives, packages of 5, $15. Also a few 10-frame, $17.50. Offer good only as long as this stock lasts.
A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—30 colonies of bees in 10-frame hives spaced 9 frames to the hive. Shipment to be made about June 1, after they are unpacked. Also write for prices on what you may want in bee supplies.
F. J. Rettig, Wabash, Ind.

FOR SALE—Cedar or pine dovetailed hives; also full line of supplies, including Dadant's foundation. Write for catalog.
A. E. Burdick, Sunnyside, Wash.

MISCELLANEOUS

Lower Price. Top Quality. Atwater's Honey.

FOR SALE—Silver Spangled Hamburg Cockerels and eggs; rare old violin.
Elias Fox, Union Center, Wis.

BLACK SIBERIAN HARES—Enormous sizes, delicious meat and beautiful fur. Write for information and prices.
Siberian Fur Farm, Hamilton, Canada.

GRANULATED HONEY SLIPS—100, 20c.
Dr. Lonney, Buck Grove, Iowa.

DR. MILLER'S BEE SONGS are in "Songs of Beedom." Ten songs for 20 cents, postpaid; 2-cent stamps taken. Also Teddy Bear souvenir postal cards, 10 for 10 cents. Address Geo. W. York, Box 84, Spokane, Wash.

WANTED—Old bee magazines. We have several customers who wish to complete their files of American Bee Journal and other magazines relating to beekeeping. The early volumes are especially desired. State what you have and price wanted in first letter.
American Bee Journal, Hamilton, Ill.

QUEENS

Write for our catalog of high grade Italian queens. Pure mating and safe arrival guaranteed.

Prices for 1921

1 to 4 inclusive	$ 3.00 each
5 to 9 inclusive	2.90 each
10 or more	2.80 each
Breeders	12.00 each

JAY SMITH, Route 3
VINCENNES, IND.

THREE BAND AND GOLDEN QUEENS

that produce hustling bees. Bred to fill the supers. Our breeding stock produced 400 pounds surplus honey in 1920. Our breeding yards are several miles apart. We breed from the very best non-swarming, gentle, long-lived, prolific strains of bees and drones that thirty years' constant work can produce and money can buy. No disease. Satisfaction guaranteed.

1 Untested ..... $1.75; 12, $1.50 each
1 Tested ..... $3.00; 12, $2.75 each

DR. WHITE BEE CO., Sandia, Texas

Not the best in color or the gentlest, but mothers of colonies that bring in the honey. My circular tells more of my queens. Prices in line. Also a few more package bees to spare.

R. V. STEARNS
BRADY, TEXAS

EAGLE "MIKADO" PENCIL No. 174

Regular Length, 7 inches

For Sale at your Dealer. **Made in five grades**
Conceded to be the Finest Pencil made for general use.
EAGLE PENCIL COMPANY, NEW YORK

QUEENS
THREE BAND ITALIANS

Order now for early delivery. Untested, $1.25, Select Untested, $1.50 each

D. W. HOWELL, Shellman, Ga.

FOR SALE

IF YOU WANT THE CHEAPEST, BUY THE BEST

I am prepared to furnish for the season of 1921 twenty-five hundred two and three frame nuclei of my bright 3-banded Italian bees, headed with young, vigorous queens. These bees are free from disease, and safe arrival guaranteed. Hoffman frames wired and on full sheets of foundation; very few combs over two years old. I am booking orders now. One-fourth or one-half cash with order, balance before shipping.

Two-frame, $4.25; three-frame, $5.25. If queens are wanted, add $1.25 each.

After May 5th I will be ready to mail queens at the following prices: Untested, single $1.50, six for $8, twelve for $15. Tested, $2.50 each. Select tested, $3.50 each. Write for prices for large lots.

A. B. MARCHANT, Jesup, Ga.

Reference: Merchants and Farmers Bank of Jesup.

TENNESSEE-BRED QUEENS

Forty-nine Years' Experience in Queen-Rearing
Breed Three-Band Italians Only

	Nov. 1st to July 1st			July 1st to Nov. 1st		
	1	6	12	1	6	12
Untested Queens	$2.50	$12.00	$22.00	$2.00	$10.00	$18.00
Select Untested	2.75	13.50	24.00	2.25	12.00	20.00
Tested	3.50	20.00	35.00	3.00	16.00	30.00
Select Tested	4.00	22.50	40.00	3.50	18.50	35.00

Select tested, for breeding $7.50

The very best queen tested for breeding $15

Capacity of yard 6000. I sell no bees by the pound or nuclei except with high priced tested and breeding queens

Queens for export will be carefully packed in long distance cages, but safe delivery is not guaranteed

JOHN M. DAVIS, Spring Hill, Tenn.

Five colonies of your stock produced 2660 finished sections—the best one 616 finished sections
JOHN M. BIXLER, Corning, Iowa, February 1, 1921

FOREHANDS' QUEENS. They Satisfy, Why?

Because of 28 years of experimental work with both queen breeding and honey production.

With breeding and selecting of imported queens, I have reached a standard which is ideal. Queens as good, but none BETTER. Why experiment? Take advantage of the life experience of my breeders.

OUR SERVICE STATION

We are ready to serve you at all times, whether you desire queens or advice. Let us help you with your bee problems. All questions are cheerfully answered.

I breed three-band Italians only.

November 1 to June 1.	1	6	12
Untested	$2.00	$ 9.00	$16.00
Select Untested	2.25	10.50	18.00
Tested	3.00	16.50	30.00
Select Tested	3.50	19.50	36.00

Orders booked now for spring delivery. One-fourth the full amount with order and balance when shipment is desired. Pure mating, safe arrival and satisfaction guaranteed. Write for circular and large order discounts. Shipment to foreign countries at receiver's risk.

Bees in 2-pound packages, 1, $6; 25 or over, $5.80; 50 or over, $5.40; 100 or over, $5. Without queens.

Will begin shipping bees as early as weather will permit.

N. FOREHAND, Ramer, Alabama

Established 1885

Beekeepers should send for our new catalog, free. Beehives made of white pine. Root Co.'s old standby make of supplies. Order early. Beeswax in exchange for supplies or cash.

J. Nebel & Son Supply Co.,
High Hill, Mo.

ITALIAN BEES

at before the war prices

O. E. TIMM, BENNINGTON, NEB.

PAINT WITHOUT OIL

Remarkable Discovery that Cuts Down the Cost of Paint 75%

A Free Trial Package is Mailed to Everyone Who Writes

A. L. Rice, a prominent manufacturer of Adams, N. Y., discovered a process of making a new kind of paint without the use of oil. He named it Powdrpaint. It comes in the f m of a dry powder, and all that is required is cold water to make a paint weather proof, fire proof, sanitary and durable for outside or inside painting. It is the cement principle applied to paint. It adheres to any surface, wood, stone or brick, spreads and looks like oil paint and costs about one-fourth as much.

Write to A. L. Rice, Inc., Manufacturers, 23 North St., Adams, N. Y., and a free trial package will be mailed to you, also color card and full information, showing you how you can save a good many dollars. Write today.

Florida Queens and Bees

Two-frame nuclei with queen, $6 each. Tested queens, $2 each. Selected tested, $3 each.

This golden and three-band Italian stock I am offering has predominated and reproduced itself in the Sand Ridge section of Central Florida for 30 years.

DIXIE BEEKEEPER

A 32-page monthly publication now two years old, devoted to beekeeping and its possibilities, as well as the general interest of beekeepers here in Dixie, $1 per year. Sample free.

WILDER'S CYPRESS HIVES are durable and satisfactory. A full line of beekeeper's supplies at low prices.

Write for catalog.

J. J. WILDER, Waycross, Ga.

PAT JULY 30, 1918

C.O.BRUNO NAILING DEVICE

Made for the Huffman Brood Frames. A combined Nailing, Wiring and Wedge Clamping Device. Has been tried and is guaranteed to do accurate work.

PRICE $7.50

Complete directions for operating are furnished with each device.

Manufactured by C. O. BRUNO
1413 South West Street, Rockford, Illinois

SHE-SUITS-ME queen-bees, prices for 1921: Untested Italians, $2 each; $1.75 each for 10 or more, prior to June 15. After June 15, 1 to 9 queens $1.50 each, 10 to 24 $1.40 each, 25 and up $1.25 each.

ALLEN LATHAM,
Norwichtown, Conn.

GOLDEN QUEENS 1921

Untested, $1.50 each, or 6 for $8. For 100 lots write for prices. I will begin shipping about April 20, and I guarantee safe arrival and reasonable satisfaction to everybody.

R. O. COX, Rt. No. 4, Luverne, Ala.

Preparedness—
One Secret of Success

The world around, but in honey production, all other factors being equal, it is the one qualification for a successful season. You will agree that when the honey flow is on, a single hour of enforced idleness in any one of your colonies is real money lost. Delays then mean dollars and cents to you. Preparedness then will spell the difference between an indifferent season, or a failure, and a highly satisfactory yield.

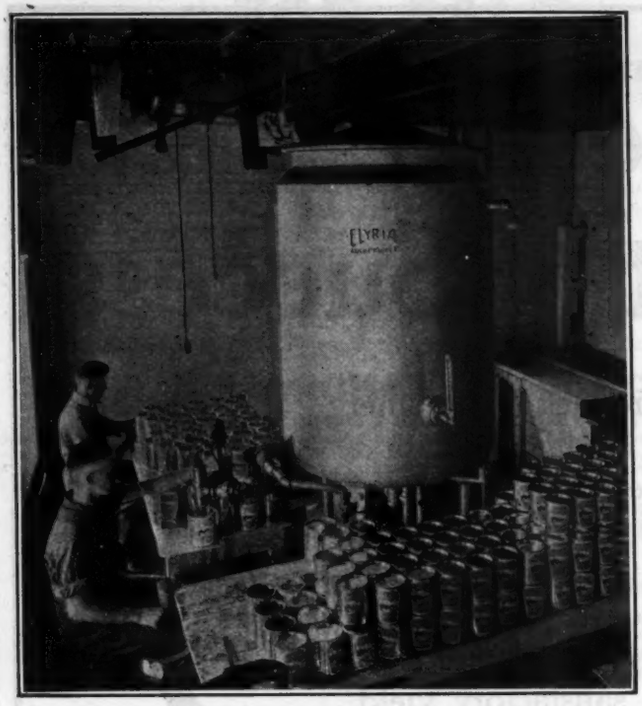
That's why we urge beekeepers to be ready for any circumstance that may develop. And because we realize that time is so important to honey producers this month, and on thru to fall, we are prepared to ship all orders promptly, from a full stock of supplies. Check the list over and if we can send to you or price for you, any of the supplies named, let us know. We are prepared to serve you, in the interests of your success. Use us.

Root-Hoffman Frames

All sizes—The New Process Foundation, Airco, Root's Quality Sections-Root Hives and Supers-Soft Pine-Thoroughly Dried and Cut-Smokers—the Root kind-Veils, Root's Improved Shipping Cases, Single and Double-Tier-Honey Containers.

THE A. I. ROOT COMPANY OF IOWA

COUNCIL BLUFFS, IOWA



Honey Blending in Glass Lined Steel Tanks

Every honey dealer recognizes the advantage of producing uniformly colored honey.

Elyria Glass Lined Steel Tanks are equipped with the Nielson Propeller Agitator. It operates on the principle of the ship's propeller, requires little power, affords quick and complete agitation and perfect blending is assured. During agitation the honey is kept at the required temperature by circulating hot water in the tank jacket.

Stout steel tanks, lined with hard, smooth glass enamel, are durable, sanitary and easily cleaned.

Elyria Honey Melting Ovens complete the melting process in four or five hours and every can is saved

Write to our nearest branch office for detailed information

THE ELYRIA ENAMELED PRODUCTS COMPANY, Elyria, Ohio

NEW YORK 103 Park Avenue | CHICAGO Conway Building | PITTSBURG Oliver Building | SAN FRANCISCO 16 California St. | LOS ANGELES San Fernando Buildin

Canadian Representatives, CANADIAN MILK PRODUCTS LIMITED, TORONTO, ONT.

MONTREAL, QUE. | ST. JOHN, N. B. | WINNIPEG, MAN. | VANCOUVER, B. C.

QUEENS THAT ARE REARED to PLEASE

Our Reliable Three-banded Italian Queens will be ready by return mail promptly after April 5. We will have 1,500. Nuclei in full operation and can take care of orders by return mail. All orders will be filled promptly or money refunded. Requeen your colonies early for the honey flow.

WHY ORDER FARMER QUEENS?

They are bred by as skillful and experienced queen breeders as can be found in the United States. There are very few places where queens are reared under as favorable conditions as in our queen-rearing yards. We devote our time to rearing as good queens as possibly can be reared. We spare neither labor nor money in developing our queens. Our first original stock was procured from the highest quality obtainable and it has always been our intention to improve our original stock each year, which we have improved to the highest point. They are very resistant to foulbrood and the very best for honey gathering.

SUPERIOR QUALITY AND SERVICE

"Box 184, Long Branch, Ontario, Canada.

"My Dear Mr. Farmer: Enclosed find the sum of $3.50 for three untested queens, which I received in good order. Let me thank you for your kind consideration and prompt action in mailing the queens. I also received your letter. Let me again recite that I am well pleased with your stock and your business methods. When I require any more queens I am glad to know with confidence that I am going to get a square deal."

"Yours truly, JAMES KELLEY."

We will treat you equally as well.

You take no risk in buying our queens. Safe arrival and satisfaction in U. S. A. and Canada. Satisfaction is left entirely to purchaser. Prompt service given to all orders. Every queen guaranteed to be purely mated.

Prices:	1	6	12	100
Untested	$1.50	$ 8.00	$15.00	$100.00
Select Untested	1.75	9.50	17.00	120.00
Tested	3.00	14.75	25.00	
Select Tested	4.00	23.00	42.00	

Write for prices on larger quantities than 100.

THE FARMER APIARIES, RAMER, ALABAMA

Where the Good Queens come from

FOR SALE

We make a specialty of shipping 2-frame nuclei. Combs are drawn from full sheets of foundation wired in Hoffman frames. Combs will be well covered with bees, and filled mostly with sealed brood and sufficient stores to do them while on their journey. Health certificate with every shipment. Safe arrival guaranteed. No more orders taken than can be filled promptly. Price of each two-frame nucleus, without queen, $5.00. Prices of queens are as follows: Untested: 1, $1.50; 6, $8.00; 12,, $15.00; 50, $60; 100, $100. Tested queens each, $2.50. When queen is wanted, add price of queen to that of nucleus. We begin shipping nuclei with untested queens May 1, but can ship nuclei with tested queens and without queens as early as April 15. Book your order now by sending in one-fourth of the amount of order. The balance you may send just before shipping date. Three-banded Italians only, and as good as can be purchased.

COTTON BELT APIARIES
ROXTON, TEXAS

COLONIES OF ITALIAN BEES

In practically new 10-frame hives at $15 each. No disease. These colonies will consist of at least five frames of brood, plenty of bees with young Italian queens. All combs are wired, straight and built from full sheets of foundation

Satisfaction Guaranteed

VAN WYNGARDEN BROS.
R. F. D. No. 4 **HEBRON, IND.**

BUY YOUR HIVES OF VOSS WOOD AT EXIRA, IOWA

Standard sizes and widths, half-lock corners, reversible bottoms, lock-cap cover. Made of selected white pine, well machined and accurately made.

Prices are in lots of 5, with frames; no foundation.

8-frame.		10-frame.
$14.50	One Story Standard	$15.90
8.10	Hive Bodies	9.10
9.45	Jumbo Bodies	9.95
4.00	Reversible Bottoms	4.25
4.25	Lock Cap Cover	4.60

3 per cent discount in lots of 100

Odd sizes and special, same price, if not using more material. Send sample. Prompt shipments.

VOSS WOOD SHOP,
Exira, Iowa.

QUALITY QUEENS AT QUANTITY PRICES

Breed Three-Band Italians only

PRICES FOR 1921

	Nov. 1 to June 30.			July 1 to Nov. 1.		
	1	6	12	1	6	12
Untested	$2.00	$ 9.75	$18.00	$1.50	$8.00	$15.00
Select Untested	2.25	11.25	19.80	1.75	9.75	16.80
Select Tested	3.50 each			3.00 each		

Breeding queens after June 15, with 2-frame nuclei, $15.00 each.

Queens are reared from mothers whose colonies are GENTLE, HARDY, and as HONEY GATHERERS will compare with any. Each and every queen reared by the latest and most approved methods, thus insuring queens that are capable of duplicating the excellent characteristics of their mothers.

I rear all my queens personally, and strive for QUALITY instead of quantity. You may rest assured that when you order queens of us you are getting among the best that can be produced. You take absolutely no risk in getting our queens for SATISFACTION and safe arrival guaranteed in the United States and Canada. Foreign shipments at receiver's risk. I sell no bees by the pound, nor nuclei, only with breeding queens. Try and estimate your needs for the approaching season and place your order early.

HERMAN McCONNELL, Robinson, Illinois

HONEY CANS

Let us figure with you on your requirements of Honey Cans. We ship any quantity desired.

WRITE FOR PRICE LIST

ADDRESS

THE UNITED STATES CAN CO., Cincinnati, Ohio
VIRGINIA CAN COMPANY, Roanoke, Va.
BOX 577-D

QUEENS, Select Three-Banded

Write for descriptive circular of our Select Italian Queens. Pure mating, safe arrival and satisfaction guaranteed

	May 1 to June 15			June 15 to Nov. 1		
	1	6	12	1	6	12
Untested	$2.00	$10.00	$18.00	$1.50	$ 9.00	$15.00
Select Untested	2.50	12.00	20.00	2.00	10.00	18.00
Tested	3.50	19.50	36.00	3.00	16.00	30.00
Select Tested	4.00	22.50	40.00	3.50	19.50	36.00

HARDIN S. FOSTER, Columbia, Tenn.

GOLDEN ITALIAN QUEENS

	May 1 to July 1.			July 1 to Nov. 1.		
	1	6	12	1	6	12
Untested	$2.50	$12.00	$22.00	$2.00	10.00	$18.00
Select Untested	2.75	13.50	24.00	2.25	12.00	20.00
Tested	4.00	22.50	40.00	3.50	10.50	36.00
Select Tested	4.50	25.00	45.00	4.00	22.50	40.00

BREEDERS $12.50 TO $25.00

10 per cent additional for Exported Queens. Queens for Export will be carefully packed in long distance cages, but safe delivery is not guaranteed.

NO NUCLEI, FULL COLONIES OR POUND PACKAGES.

BEN G. DAVIS, Spring Hill, Tenn.

AT LAST MR. BEEKEEPER

MAC DONALD ALUMINUM HONEYCOMBS

YOU MAY ORDER FROM 1 to 10,000

AND KNOW THAT YOU WILL RECEIVE THEM ON TIME

The New Brood Rearing Aluminum Comb

55c f. o. b. Pasadena

RAFAEL & WING, Inc.
16 Stuart Street
SAN FRANCISCO, CAL.

Are our distributors of aluminum combs for

Washington
Oregon
Nevada
Northern California
Hawaiian Islands

Beekeepers in the above districts should get in touch with them

Hoffman, 60c f. o. b. Pasadena

Langstroth, 60c f. o. b. Pasadena

Jumbo, 70c f. o. b. Pasadena

Shallow, 50c f. o. b. Pasadena

Prompt and Safe Delivery Guaranteed

DUFFY-DIEHL, Inc., 17-19 South Chester Street, Pasadena, Cal.

FOREHAND'S THREE BANDS

THE THRIFTY KIND

are bred from the best stock that can be gotten from Italy and from our own apiaries. We are constantly breeding and selecting to improve the thriftiness, hardiness, gentleness and beauty of our bees. Twenty-nine years of select breeding have brought our strain of bees up to a standard **surpassed by none but superior to all.**

We guarantee pure mating, safe arrival and satisfaction in the U. S. and Canada.

Write for circular giving full information about our bees and queens

PRICES UP TO JUNE 30

	1	6	12	100 or over ea.
Untested	$2.00	$10.00	$18.00	$1 40
Select Untested	2.25	11.50	21.00	1.65
Tested	3.00	16.00	30.00	----
Select Tested	4.50	25.00	45.00	----

One pound package: 1, $3.75; 25 or over, $3.50; 50 or over, $3.25; 100 or over, $3 00.

Two pound package: 1, $6 00; 25 or over, $5.80; 50 or over, $5 40; 100 or over $5.00.

Prices are quoted per each package. Add the price of the queen wanted. No three pound packages for sale. Safe arrival is not guaranteed on queenless packages.

W. J. FOREHAND & SONS, Fort Deposit, Ala.

Crop and Market Report

Compiled by M. G. Dadant

CONDITION OF BEES

Throughout the whole of the United States the condition of bees is excellent. In fact they are a little too forward for this time of year, and the warm weather has induced so much brood-rearing that precautions must be taken to prevent starvation among the bees during the later spring. We advise all beekeepers to look carefully after their bees at every available opportunity and make sure they have plenty of stores, so that brood-rearing will not be hampered through lack of honey.

HONEY PLANTS

It is too early yet to make any guess on honey plants in the Rocky Mountain region and in the northern half of the United States.

California, however, has had abundant rain and prospects seem very flattering out there. Throughout the white clover region immediately north of the Ohio River, rain has, in part, offset the lack of snow, and clover is coming forward rapidly, conditions seeming very much better than a month ago. The Southern States predict a very good year, as prospects seem excellent.

HONEY

Contrary to expectations, honey has not risen any in price since our last report. In fact, California is now transporting honey in carload lots as follows: White alfalfa 8½c, amber alfalfa 7c. Package honey is being quoted in carloads, also as follows: 24 2-lb. cans $9.50, 12 5-lb. cans $10, 6 10-lb. cans $10, with carload freight rate allowed to destination.

In the central West honey prices are holding up fairly well, although there is practically no sale in carload lots and only small sales in a wholesale way.

The main stumbling-block on honey prices seems to be the glutted condition of the New York market, which has large quantities of foreign honey still unsold and which is being offered as low as 50c to 60c per gallon.

In fact, the price is now so low in New York that very little honey is coming in, the tendency being to ship directly to Europe at a price which will net as much as shipment through the New York market into the United States.

There is a tendency throughout the whole country for retailing of honey. In fact many producers have bought a stock of friction-top pails and are now putting up their honey in 2½, 5 and 10-lb pails.

The bulk of honey left in the hands of producers remains in the Inter-mountain States, Arizona and New Mexico, and in California, with scattering lots held by large beekeepers in the Southeast, in Michigan and Wisconsin, and some in New York and Pennsylvania. In other parts of the country conditions seem to be favorable towards a disposal of all honey before the new crop comes in.

It is probably at its lowest point now and there will likely be a tendency for prices to stabilize at a little higher value as soon as foreign stocks are disposed of.

Recommendations have also been made for duty on honey coming into this country of 40c to 60c per gallon. Without much doubt some duty will be placed upon honey in the new tariff bill. This, of course, will tend to raise the price of all honey in this country. Just where the market will stabilize is a hard question.

"falcon" BEES AND BEE SUPPLIES

Recommended cheerfully because used successfully for over 40 years.

Safe arrival on shipments guaranteed. ORDER NOW.

Distributor for the Central West

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"Where the best Beehives come from"

BEEKEEPERS WE MANUFACTURE DOVETAILED HIVES, HOFFMAN FRAMES, SECTIONS AND SHIPPING CASES

Our hives are made of best grade White Pine, cut accurate and smooth to standard measure ections are made of Basswood polished on both sides. There are no better made.

We carry a complete line of everything used in the apiary. Our shipping facilities are as good as can be found anywhere. We want your business. We guarantee prompt and satisfactory service. Price list free.

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PACKAGE BEES

Dependable Three-Band Queens. Prompt service. Prices right

E. A. HARRIS, Albany, Ala.

BEE SUPPLIES

We are prepared to give you value for your money. Our factory is well equipped with the best machinery to manufacture the very A-best supplies that money can buy. Only the choicest material suitable for bee hives is used. Our workmanship is the very best. Get our prices and save money.

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TINS AND GLASS JARS

ORDER NOW FOR NEXT CROP PACKING

2 1-2-POUND CANS

2 dozen reshipping cases	$ 1.45 per case net
In 100-can crates	6.50 per crate net
In 200-can crates	11.00 per crate net
In 500-can crates	24.50 per crate net

5-POUND PAILS WITH HANDLES

1 dozen reshipping cases	$ 1.35 per case net
In crates of 100	8.30 per crate net
In crates of 200	16.25 per crate net

10-POUND PAILS WITH HANDLES

In one-half dozen cases	$ 1.10 per case net
In crates of 50	6.70 per crate net
In crates of 100	12.75 per crate net
5-gallon tins, used, good condition, 2 to case	$0.50 per case
5-gallon tins, new, 2 tins to wood case	1.35 per case

White Flint Glass, with gold lacqd. wax-lined caps

8-oz. honey capacity cylinder style	$1.50 carton of 3 doz.
15-oz. honey capacity, table jar style	1.40 carton of 2 doz.
Quart or 3-pound honey capacity, Mason style	1.00 carton of 1 doz.

NOTE: LOW PRICES SUBJECT TO CHANGE AT ANY DATE

HOFFMAN & HAUCK, Inc., Woodhaven, N. Y.

HONEY PRODUCERS TAKE NOTICE

Do you realize that it is only a short time until your bees will be taken out of winter quarters? Have you thought about supplies for next season? Do not wait until swarming time for that means dollars out of your pocket. Order your supplies NOW.

We manufacture and carry in stock a complete line of bee supplies ready for prompt shipment. Send us a list of supplies you will need and we will be pleased to quote you our price. Our 1921 descriptive catalog and price list is now ready for mailing send us your name and address and we will mail you our catalog.

AUGUST LOTZ COMPANY, Boyd, Wisconsin

PORTER BEE ESCAPE SAVES HONEY TIME MONEY

For sale by all dealers.
If no dealer, write factory
R. & E. C. PORTER, MFRS.
Lowistown, Illinois, U. S. A.

(Please mention Am. Bee Journal when writing)

HONEY

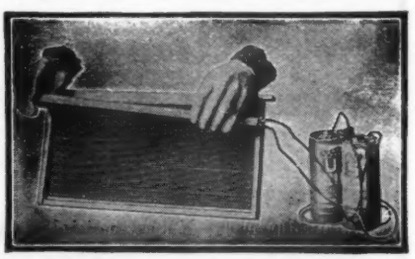
If interested in either **extracted or comb** write for our prices before buying. **They are right.**

C. C. CLEMONS CO.
DEPT. A
KANSAS CITY, MO.

BARNES' FOOTPOWER MACHINERY

Read what J. E. Parent, of Chariton, N. Y. says: "We cut with one of your Combined Machines last winter 50 chaff hives with 7-in. cap, 100 honey-racks, 500 frames and a great deal of other work."

W. F. & JOHN BARNES
995 Ruby St., ROCKFORD, ILLINOIS



ELECTRIC IMBEDDER

Price without Batteries $1.50
Not postpaid.

Actually cements wires in the foundation. Will work with dry cells or with city current in connection with transformer. Best device of its kind on the market.

For sale by all bee supply dealers

Dadant & Sons, Manufacturers HAMILTON, ILL.

BEE SUPPLIES

We carry a complete stock of supplies at all times, and can make prompt shipments. Our prices will interest you.

Send Us Your Inquiries

A. H. RUSCH & SON CO.
Reedsville, Wis.

QUEENS AND BEES

We are now booking orders for spring delivery.

NUCLEI ON ALUMINUM COMBS

2-Frame nucleus without queen $6.00
3-Frame nucleus without queen 7.50

PACKAGE BEES

1 lb. Package ..... 1 package, $3.00; 12 packages, $2.85
2 lb. Package ..... 1 package, $5.00; 12 packages, $4.75
3 lb. Package ..... 1 package, $7.00; 12 packages, $6.60
Add price of queen desired.

QUEENS	1	12	50
Untested 3-band Italian	$1.50	$15.00	$55.00
Tested 3-band Italian	2.50	27.50	112.50
Select tested 3-band Italian	3.50	37.50	150.00

We guarantee safe arrival.

PATTERSON & WINTERS, Jourdanton, Texas

Bees in Packages by parcel post by return mail, or soon. 10,000 pounds of Italian Bees ready to ship commencing April 5.

Three-Band Queens or Golden Queens

1-lb. swarms with young queens, $5.00 each; 6 or more, $4.90 each
1½-lb. swarms with young queens, $6.25 each; 6 or more, $6.00 each
2-lb. swarms with young queens, $7.00 each; 6 or more, $6.90 each
3-lb. swarms with young queens, $9.00 each; 6 or more, $8.90 each
5-lb. swarms with young queens, $12.50 each; 6 or more, $12.00 each

The 1½-lb swarms are especially prepared for our two-pound Canadian parcel post trade. Larger packages over weigh postal limit. You get full 1½ pounds of bees to the package. We tried this size package ourselves in Northern Ontario last season and had them build up FROM JUNE 1ST to strong colonies which, on an average, made over 50 pounds of surplus honey, besides going into winter quarters with plenty of stores.

WHAT OTHERS SAY ABOUT OUR BEES

"The two 3-lb. packages bought of you last May did all right. One made 185 sections and gave one swarm, and the other made 296 sections and gave two swarms." (Name on request), Kimmell, Ind.

"The ten 1-lb. swarms bought of you last spring, although delayed in transit, and therefore taking five days to reach me, arrived in fine condition, not a cupful of dead bees in the lot. They did well, more than paying for themselves the first season, and went into winter quarters in fine condition." (Name on request), Alabama, N. Y.

"We are only one mile from Lake Erie, and exposed to high, cold winds, in fact this is the windiest place along the Great Lakes. Your bees were able to winter with only an insignificant loss. As for honey, they averaged 175 lbs. each of extracted surplus, did not swarm, and gave an artificial increase of 30 per cent, which is as fine record as can be had in this locality, especially when the work is done entirely by amateurs." (Name on request), North East, Pa.

(The above were 1-lb. packages and were worked by students going to college at this place.)

M. C. BERRY & CO., Hayneville, Ala., U. S. A.

Pure Italian Queens of the Best Known Strain

A. I. Root and H. D. Murry Three-Banded only

Booking orders now for spring delivery of two-frame nuclei, two-pound packages, and full colonies

Prices	1	12
Untested	$1.50	$14.50
Tested	2.25	24.00
Select tested	3.00	30.00

Two-frame nuclei with untested queen, $6; 25 or more, $5.50.
Two-frame nuclei with tested queen, $6.75; 25 or more, $6.25.
Two-pound package hybrid bees, each $4. Add price of queen wanted.

No disease near here. Health certificate with all I have for sale. Safe arrival and satisfaction guaranteed.

P. S. Terms one-fourth with order, balance due at shipping time.

BAUGHN STONE, Manchester. Texas
FORMERLY MURRY & STONE

LILLY'S
Established 1885

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Yakima
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HEADQUARTERS FOR

LEWIS BEEWARE
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WESTERN PINE HIVES

Write Us. It Pays

LILLY'S Established 1885 — The Chas. H. Lilly Co. Seattle, Yakima, Portland

VIGOROUS YOUNG ITALIAN PROLIFIC LAYING
LOGAN QUEEN
$2.00
DOOLITTLE STRAIN
ORDER NOW
ALL QUEENS ARE LAYING BEFORE SHIPMENT
Shipment After May 15, Alton L. Logan, Edwardsville, Ill.

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$4 or $5 a month WILL BUY
A Standard, Guaranteed TYPEWRITER With Every Modern Writing Convenience
Write Today For Illustrated Circular Explaining Try-Before-You-Buy Plan
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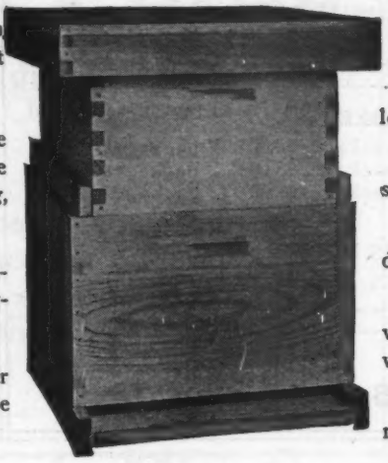
MODIFIED DADANT HIVE

Your present brood equipment can be put above the Modified Dadant hive used as full depth supers.

Features are: Deep frames, large one-story brood-nest, frame space ventilation, excellence in wintering, swarming easily controlled.

Glance at this illustration to compare this hive with "Standard" Langstroth hive.

You can get 40 per cent greater brood-comb area than in the "Standard" ten-frame Langstroth.



MODIFIED DADANT HIVE FEATURES

1. Eleven frames, Langstroth length, Quinby depth.

2. Frames spaced 1½ inches for swarm control.

3. Extracting frames 6¼ inches deep.

4. Dovetailed body, regular reversible bottom and metal roof cover with inner cover.

5. Langstroth "Standard" equipment easily used with this hive.

For free booklet write any distributor of Lewis "Beeware," or to

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DADANT & SONS, Hamilton, Illinois

Bee Supplies from the Wood Eternal

Bottoms, Covers and Bodies that Defy Decay, Good Material, Good Workmanship, Good Prices

Five ten-frame dovetailed hives, complete	$16.00
Five best ten-frame wood covers made	5.00
Five ten-frame cypress bottoms, full ⅞ in. thick	4.00

ITALIAN BEES AND QUEENS

Guaranteed to give you satisfaction

Untested queens $2.00 each	$18.00 per dozen
Tested	$3.00 each

NUCLEI

One frame, no queen	$3.50
Two frame, no queen	6.00
Three frame, no queen	8.25

FULL COLONIES

New painted hives, good combs, young tested queens

Colony in eight-frame hive	$20.00
Colony in ten-frame hive	22.00

POUND PACKAGES

One pound package, no queen	$3 50
Two pound package, no queen	6 00

OUR SPECIAL PACKAGE

Customers claim this is the best package going

One frame brood with one pound bees, no queen	$6.00
Car load bees in eight frame hives shipped from Helena, Ga., each	12.50

Send for Catalog. Give us a trial order

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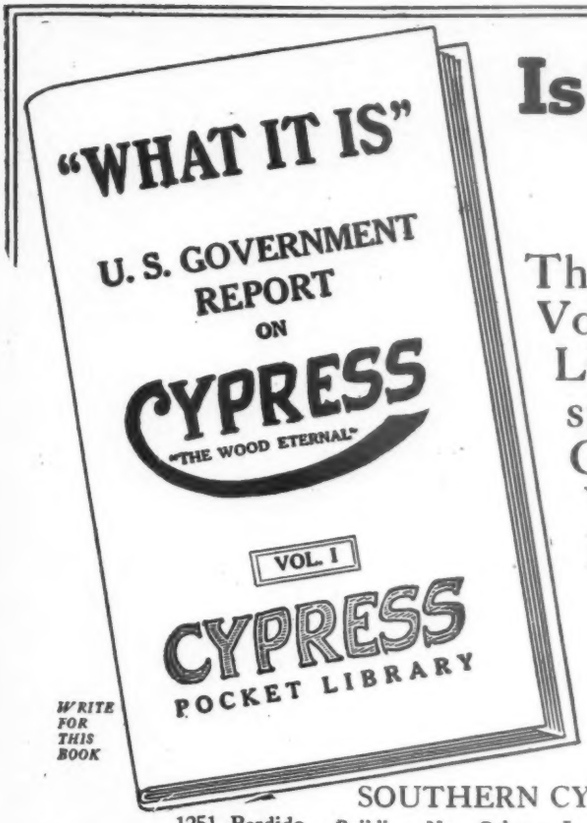

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Then Mr. Bee-man, just write for Volume I of the Cypress Pocket Library and read what our respected Uncle has to say about Cypress ("The Wood Eternal.") You'll then see why any bee-hive, or bottom or winter case not made of Cypress is not so good as it might be. 42 other volumes all free. The list is in Volume I. Write and it comes.

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Insist on TRADE-MARKED Cypress at Your Local Lumber Dealer's — If he hasn't it, *LET US KNOW IMMEDIATELY*

ALUMINUM HONEY COMBS

Have you Extracting Combs sufficient for those short heavy honey flows?

The shallow extracting Aluminum Honey Comb gives you immediate and adequate storage

PRICE LIST

Standard Langstroth (Hoffman brood-frame) size, each	60c
Shallow Extracting (5⅜ in. deep) size, each	50c
Modified Dadant (Jumbo depth) size, each	70c

Prices are f. o. b. San Antonio, Texas.

Parcel Post weight, 1 comb	2 lbs.
Parcel Post weight, 10 combs	11 lbs.
Parcel Post weight, 20 combs	20 lbs.

Write for our new catalog containing full description and prices on

LEWIS BEEWARE, DADANT FOUNDATION, ALUMINUM HONEY COMBS

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USE AIRCO FOUNDATION
PUT YOURSELF IN A POSITION
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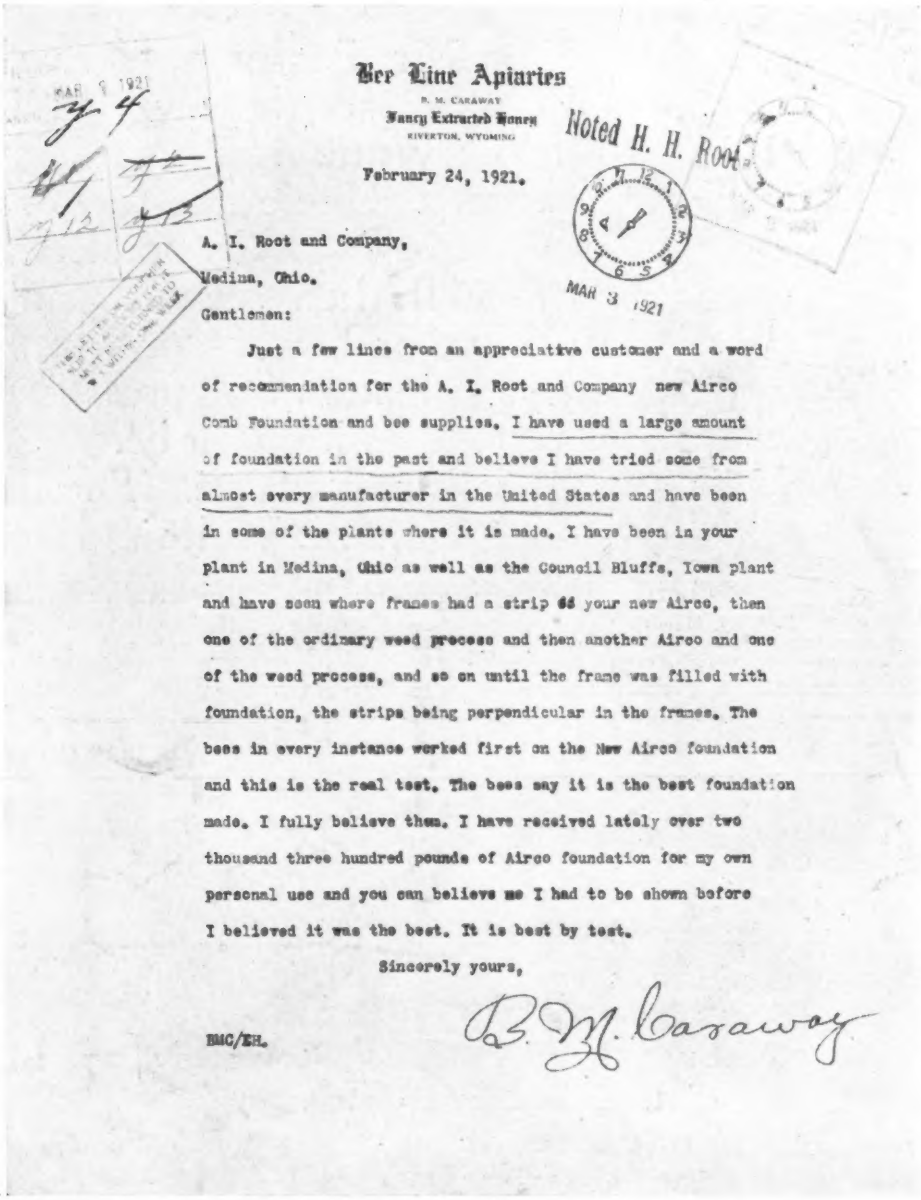

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Fancy Extracted Honey

RIVERTON, WYOMING

Noted H. H. Root

February 24, 1921.

MAR 3 1921

A. I. Root and Company,

Medina, Ohio.

Gentlemen:

Just a few lines from an appreciative customer and a word of recommendation for the A. I. Root and Company new Airco Comb Foundation and bee supplies. I have used a large amount of foundation in the past and believe I have tried some from almost every manufacturer in the United States and have been in some of the plants where it is made. I have been in your plant in Medina, Ohio as well as the Council Bluffs, Iowa plant and have seen where frames had a strip of your new Airco, then one of the ordinary wood process and then another Airco and one of the wood process, and so on until the frame was filled with foundation, the strips being perpendicular in the frames. The bees in every instance worked first on the New Airco foundation and this is the real test. The bees say it is the best foundation made. I fully believe them. I have received lately over two thousand three hundred pounds of Airco foundation for my own personal use and you can believe me I had to be shown before I believed it was the best. It is best by test.

Sincerely yours,

B. M. Caraway

BMC/EH.

For your convenience, prompt service and saving on carriers' charges you can address the A. I. Root Co. at any of the following points, where Airco Foundation is always in stock:

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Indianapolis, 873 Mass Ave.
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San Antonio, P. O. Box 765.
Los Angeles, 1824 E. 15th St.
San Francisco, 52-54 Main St.
New Orleans, 224 Poydras St.
New York, 23 Leonard St.
Philadephia, 8-10 Vine St.
Norfolk, 10 Commerce St.
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